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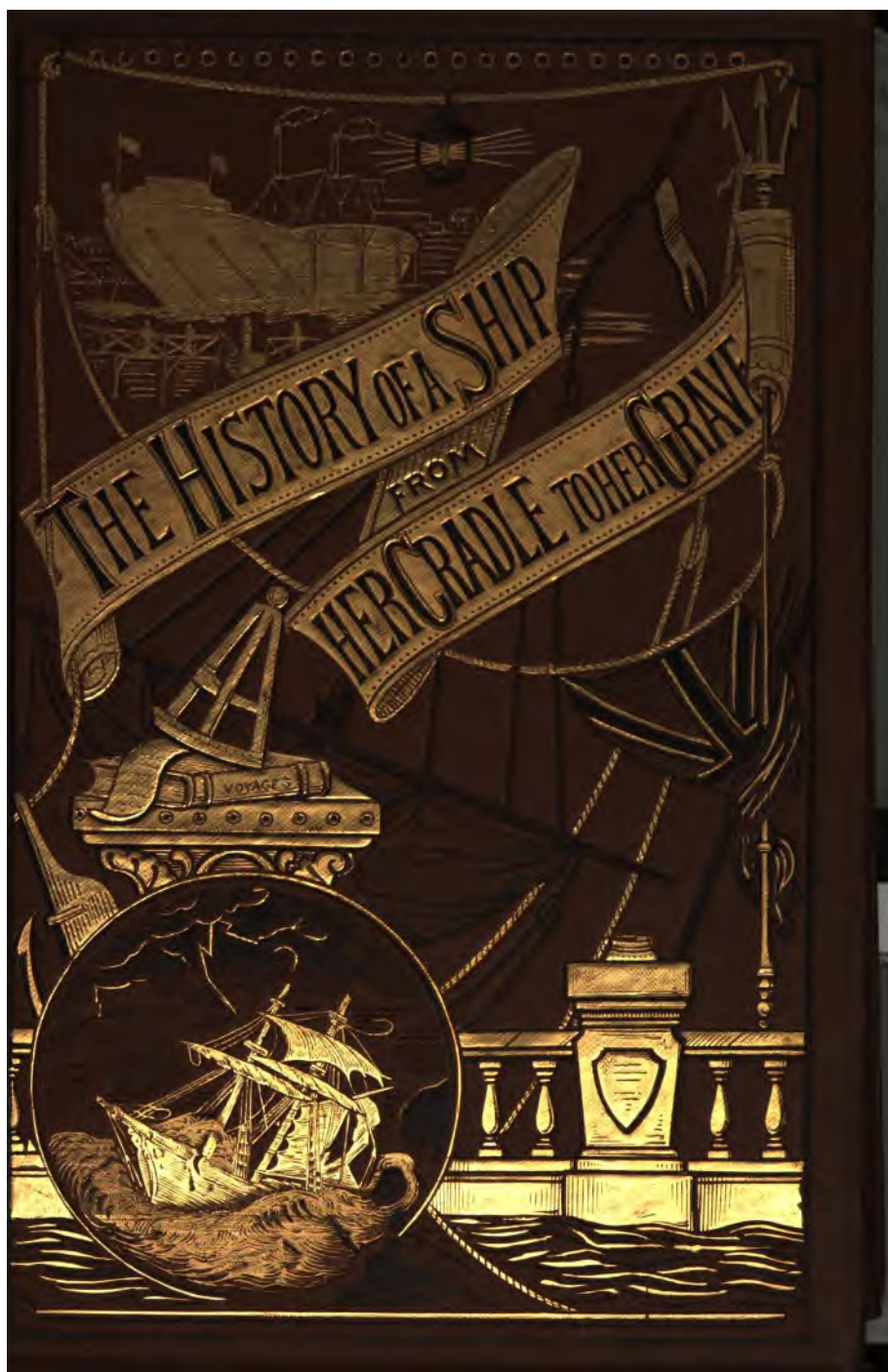
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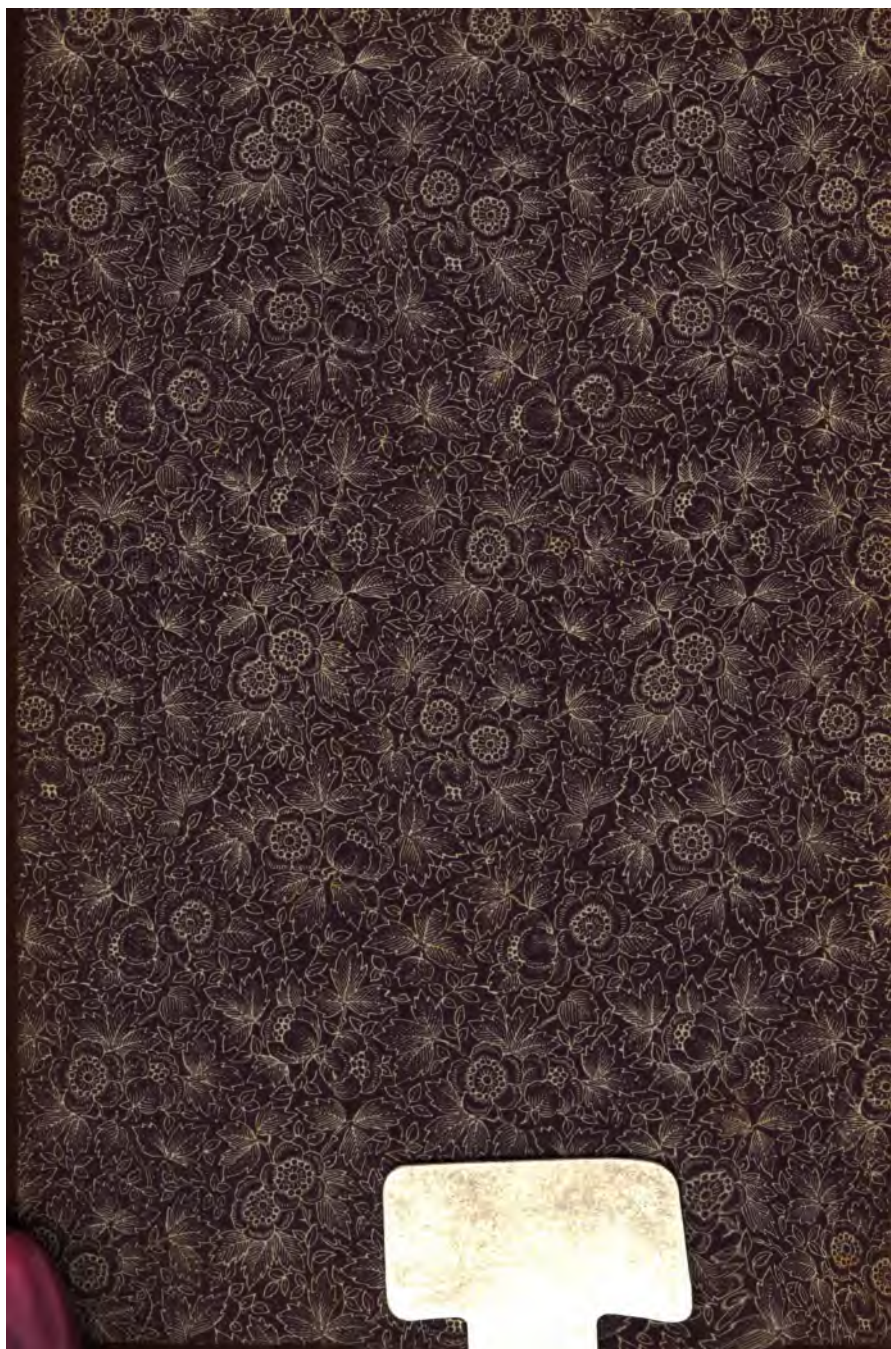
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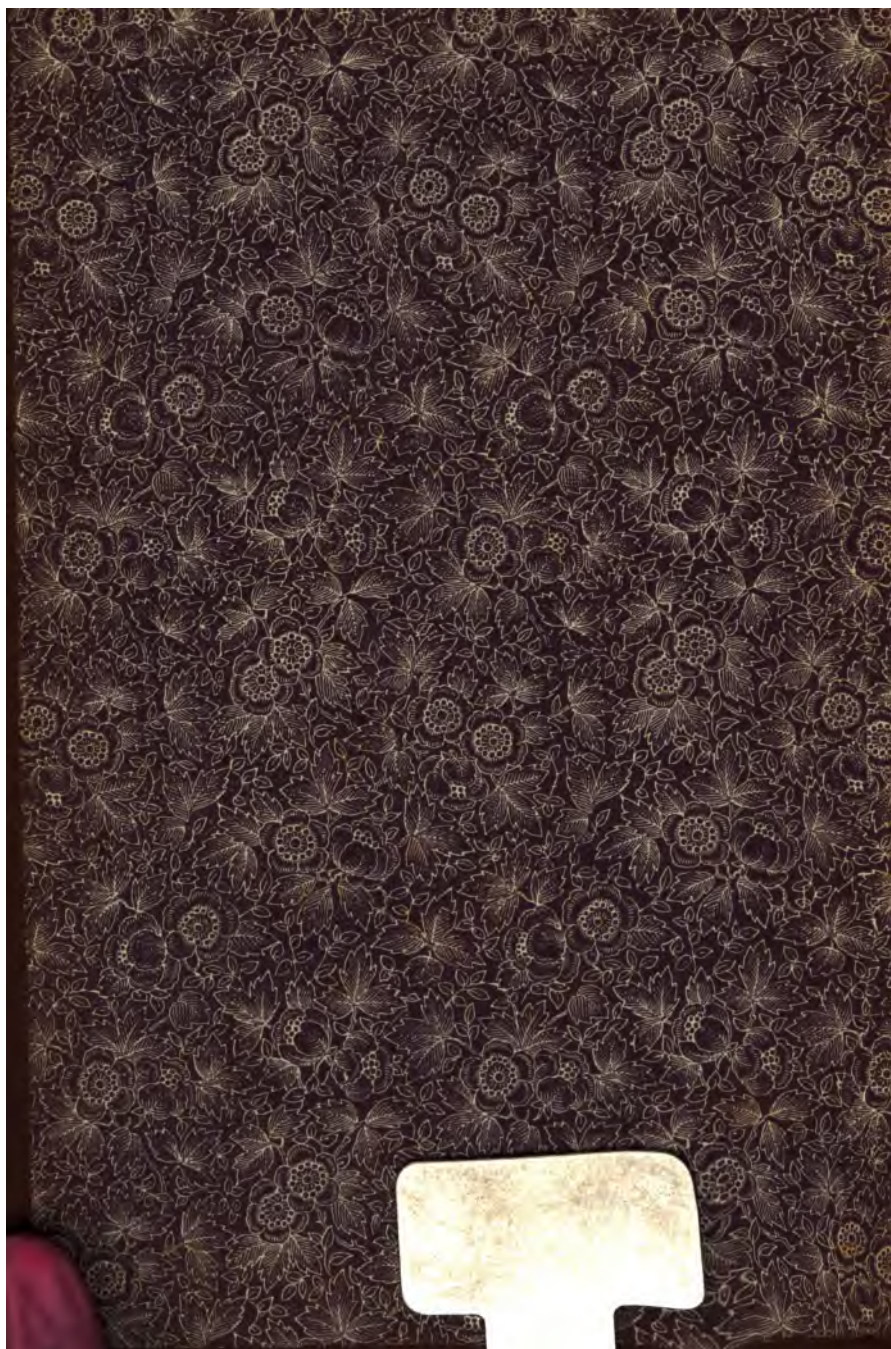
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THE HISTORY OF A SHIP.



Uniform with this Volume.

SIR EDWARD SEAWARD'S NARRATIVE
OF HIS SHIPWRECK. With Preface by
W. H. G. KINGSTON, and Illustrations.

GREAT BATTLES OF THE BRITISH
NAVY. By Lieut. C. R. Low. With Coloured
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Gen. Sir THOMAS SEATON, K.C.B.





THE
HISTORY OF A SHIP
FROM HER CRADLE TO HER GRAVE

WITH A
SHORT ACCOUNT OF MODERN STEAMSHIPS
AND TORPEDOES



A NEW EDITION



LONDON
GEORGE ROUTLEDGE & SONS
BROADWAY, LUDGATE HILL
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1882.

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PREFACE

TO THE

PRESENT EDITION.



HOWEVER valuable this work may be as an account pleasantly told of the experience of Grandpa, it would be scarcely fair to issue the present edition without adding some account of the marvellous changes wrought by steam, and by machinery driven by steam, since Grandpa's day. Accordingly a short account of the steam-engine, its application to propelling vessels, and its gradual introduction into the Mercantile Marine and the Royal Navy, with the changes in the build and rig of the vessels consequent thereon, has been given succinctly, in the hope that it may interest the present generation.



PREFACE.



THE best apology which the Author of this work can offer for ushering his book into the world, is the absolute want of some treatise, arranged as an instruction book for youths, on the subject of which it treats.

When in the society of children, he has frequently heard such expressions as these: "Mamma, I wish you would buy me a ship!" "Papa, is there not any book that tells about ships; how they are built, and rigged, and how they sail? I wish you would get me one; I should so much like to read it!" Another would say, "Oh, mamma, William Talbot has a large ship, but he does not know the name of any part of the rigging; and when he sails it he gets it frequently upset, because he does not know how he should set the sails and the rudder, to make it steer properly. What a pity it is

that there is not a book to explain to us how we should do all this!" Another young gentleman will be reading a work on naval matters, and he will get puzzled by the following expressions: "Haul in the weather main-brace;" "Let go the lee;" "Man the clue garnets;" "Let the main-sheet fly." Of such terms as these, many may ask their parents in vain for an explanation.

The Author hopes that the following pages will, in some degree, remove this bar to the attainments of youth.

For the sake of rendering the whole plain and easy of comprehension to the juvenile reader, numerous illustrations and diagrams are interspersed throughout the work; nor is the Author aware that he has overlooked anything which would tend to render his work both useful and entertaining.



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CHAPTER I.

Grandpa Ben relates a circumstance that occurred in his younger days,—what induced him to write this work—Grandpa's grandchildren are introduced to the reader—What joy and excitement they displayed on hearing that Grandpa was going to write a book about ships.

IN my youthful days there were thousands of English people who had never seen a ship ; and although railways have familiarized many with the sea and with ships, there are still large numbers who have never seen either. I can well remember the wild enthusiasm displayed by two of my cousins who came to visit my father's home in Liverpool when I was about fourteen, and their eagerness to be taken to see the ships.

I was surprised, nay, even disappointed with this ; for I had imagined they would, as most schoolboys do, have chased with me to the play-room, to examine and amuse themselves with my toys and books. And yet why was I disappointed ? Only because it had never occurred to me that they had not seen a ship ; and coming now, for the first time, from a large inland town to our residence at a considerable sea-port, where ships of all classes and descriptions are to be met with, their curiosity to see them was at the highest pitch ; nor would they be satisfied until I had taken them to a spot that commanded a view of the shipping in the harbour.

Yet some will say, " You have not fully explained why you were disappointed, Grandpa ? " Now, it was simply for this reason : I had been always accustomed to the sight of ships ; I had seen them leaving port in all their splendour, with every sail set to catch the favouring breeze ; and I had seen them return, laden with the produce and the luxuries of foreign climes ; whereas my cousins had only heard of them. Now, this had never entered my young brain ; and here had I been for weeks in expectation of this, the first visit of my cousins, puzzling myself to devise schemes of amusement for them to such an extent, that everything else was neglected—my lessons at school were not learnt—my writing was agitated—my arithmetic incorrect—and at home so busy was my fancy at work upon some plan of enjoyment with my cousins, that I partly forgot my meals, and slumbered but half the nights. Now, was it not a disappointment,

•

that, after all this anxiety, I should never once have thought of the ships, the sight of which gave them so much surprise and delight?

Perhaps some of my young readers will exclaim, "Ah! I wish I had been your cousins, and have seen them too, for I long to know all about them; they must be very grand."

It was on a beautiful summer evening, whilst sitting in an harbour by the side of a large fish-pond, in the lawn of a delightful residence, situate in the picturesque and romantic county of Devon, and near the sea-coast, that the above circumstance crossed my mind.

My thoughts were more particularly led in this strain by the fact that I was then witnessing the amusement of several rosy-cheeked boys and girls (my grandchildren), who were sailing some little ships in the lake, and expressing their extreme delight in joyful shouts of laughter, when any of their miniature fleet accomplished their dangerous voyage from one end to the other of the sheet of water, in which direction the wind was blowing at the time.

Now, it occurred to me that there were many young folks who, like my cousins, would be delighted to see the ships, or else to know something about them; how they were built—how rigged—how the sails were fixed—and in what manner, when the ship was fully equipped and ready for sea, she was guided across the ocean, whether in daylight, in darkness, or in the midst of terrific storms, to any part of the world, when no land was visible for days and weeks together. I was certain that to some this must be a puzzling subject, and I was

half inclined to sit down and write a book on these matters, to enlighten those young inquisitive people, which a little circumstance that just then occurred with my young grandchildren really induced me to do.



EDWARD'S SHIP AT SEA.

The eldest of them, Edward, who was about twelve years of age, had a fine ship, with three masts and three decks, from the port-holes of which glistened the mouths of small brass cannon. It had also a full set of sails. I had presented it to him a day or two before, in reward for the very favourable report I had received

of his general good conduct and attention to his studies at school.

Now, Edward's ship—I should say his line-of-battle ship—had accomplished her voyage twice through the lake, without any more serious adventure than running over a frigate belonging to Charles, and a cutter belonging to Edmund, both of which were left on their sides, or on their beam-ends, as sailors say. Another little cutter, belonging to William, got entangled with the rigging of the larger ship, and was brought to the shore as a prize by it. It was now necessary that the aid of Thomas (the gardener) should be called in, to go off in the boat kept for fishing on the lake, to



EDMUND'S CUTTER.

rescue Charles's frigate, and set the little vessel again in motion before the wind, in which he had just succeeded, when he was obliged to pull in another direction to the assistance of Edward's ship, which had been caught by a sudden gust of wind, and, having too much sail set, without sufficient ballast in her hold, had turned over, and lay on her beam-ends, with her masts and sails buried in the water and in danger of sinking. Thomas, however, reached her in time to prevent such a disaster, and, having set her again in motion, she continued her course, sailing as proudly through the water as if nothing had happened, and reached the shore in safety.

Witnessing the triumphs and disasters of this little fleet of ships, many events of my past life recurred to my mind—some of storms and calms, and others of the exciting and death-dealing battle. Many old messmates, some now, alas! tenants of the tomb, were recalled to memory, and conversations, and acts performed with them, acted o'er again. Busy fancy was at work,

when I was suddenly interrupted in my reverie by Charles, who had recovered his frigate, and came bounding into the harbour with it in his hands, saying, "Oh, dear Grandpa, how I should like to be a sailor; and then, when I was old enough, I should have the com-

mand of a real ship like Edward's, and I should be able to prevent such an accident occurring to my ship as just



CHARLES' FRIGATE.

now occurred to his; for I would take in the sails if the wind increased."

"My dear Charles," said I, "the expressions you have now used are similar to those uttered by myself when about your age, some sixty years ago. I had been amusing myself as you have, sailing a little ship in this very pond, when, seeing my uncle walking across the lawn, I ran to him and said, 'Oh, dear uncle, I should like to be a sailor!'

"Little did I think, my dear boy, that the fulfilment of this wish would be attended with so much care and suffering, hardships and privations, as I have since found are the inevitable lot of sailors. The idea of commanding a large ship—seeing the men obey my orders—and the proud vessel steering her course with all sail set, and that I alone should order this to be done, was, in my young mind, sufficient reward to compensate for any difficulty or hardship that might be encountered in the commencement of my career as a sailor.

"However, my child, my uncle made known to my mother the wish I had expressed, and everything was said and done to induce me to alter the resolution I had formed to become a sailor, but without effect.

"I was just thinking, Charles, when you came into the harbour, how many there were of your age, who had never seen a ship at all, and who could scarcely imagine what it was like—never having seen anything of the sort, except, perhaps, a canal-barge, which you know is a boat of about forty or fifty feet in length, drawn by means of

one or two horses, along a channel cut for the purpose, and used for the conveyance of merchandise from one inland town to another. Now you, who have seen large ships, cannot form any idea of the anxious wish many of these have to see them, or at least to know all about them ; and I was thinking of writing a book that would make them generally acquainted with everything about a ship. Your remarks have confirmed that intention, and I shall at once commence my work, in which I will explain all that is worthy of notice about shipping ; and lest any may imagine that a sailor's life is only a delightful one, I will introduce a few incidents that I have met with in my own voyages, which will prove that a sailor's life, although it has its pleasures, has also its difficulties and drawbacks. I will commence to-morrow morning ; and, as I proceed with my work, I will read to you and your brothers in the evenings what I have written during the day."

"Thank you, thank you, dear Grandpapa ; I shall be so glad to know all about a ship, and so will Edward, and sisters, that I must go and tell them the treat you have promised us ;" and away Charles scampered, shouting, "Edmund ! Edward ! Charlotte ! all of you come to me, I have such news for you ! Grandpapa is going to write a book about a ship ; he says he will commence it to-morrow, and in the evening he will read to us what he has written during the day. Won't it be delightful ? Oh ! how I wish to-morrow was come, don't you ?"

"Indeed I do," exclaimed Edward.

"And I," said Charlotte.

"And so do I," cried Edmund.

"And I too," added little William, the youngest of the group ; and again they hurried to their joyful sport, calling to each other frequently, "Oh ! will it not be delightful ? I wish to-morrow would come !"

At length it became time for the young ones to return to the house to have the evening meal, to receive their parents' blessings, and, with a renewal of the promise from dear Grandpapa of the history of the ship on the following evening, the children departed to their beds.

In accordance with my wish, some easy lessons were recited during the morning of the children's holidays, with the view of keeping those last acquired at school fresh in the memory ; a plan that should be followed by all parents and guardians of children, as many youths during a long holiday, by neglect of studies, will lose more in one month passed in play and pastime only, than can be recovered in two or three, on their return to school. I do not mean to say, that the whole holidays should be devoted to study, nor that the same strictness should be adopted as that to which they are accustomed at school ; but an hour or so in the morning may be spared for the purpose of committing a few easy tasks to memory, and the remainder of the day is quite sufficient for sport.

I need not tell you, my young friends, that the lessons for the day on which the history was to be commenced were soon learnt, and, long before the evening arrived,

many visits had been paid by each of the youngsters to the clock ; and never did they think the hours had passed so slowly as on this day.

"Do you know," says Charles to Edward, "what time it is now?"

"No, but I will go and look at the clock. It is only two yet," says Edward ; "it wants four hours to six o'clock ; what shall we do till it comes, to make the time appear shorter? Suppose we go and sail our ships again."

But they were all too excited to continue for any length of time in any particular sport ; after sailing the ships for a little while, they joined the haymakers on the lawn, and having amused themselves with a few tumbles in the hay, this sport became distasteful ; other pastimes were tried, and with the same result ; nothing but the ship would do, and it was not six o'clock yet.

At length the long-wished-for hour arrived, and, punctual to a minute, the whole band assembled around me in the arbour.

For some time the attention of the group was wholly occupied with the folio of drawings I produced ; and many curious remarks, and not a few mistakes, were made by each—such, for instance, as pointing to the round-top, and calling it the big cross-trees, and naming the fore-stay the main-brace, and such-like errors. Question upon question was asked without waiting for answers, in such quick succession, that I doubt whether a whole ship's company, had they been there, would have been able to answer in a day.

At length, after considerable puzzling at the drawings, and having satisfied themselves that they could not understand them without my assistance ; and, moreover, having discovered that I could not possibly answer five hundred questions all at once, they exclaimed, "But where is your writing, Grandpapa ? We will be very attentive, if you will read it to us."

Their bright eyes sparkled brighter, as the first part of the manuscript was drawn from my pocket. What it contained will be seen in the next chapter.





LINK-OF-BATTLE SHIP, TIME OF GEORGE I.



CHAPTER II.

Contains a little information about the ships used in the reigns of Kings Richard III., Henry VII., and Henry VIII. ; also of bombs and fireships—The state of the Navy at the death of George I.—The framework of the *Prince of Wales* described—Why the bottoms of ships are coppered—A little touch of natural philosophy about the ribs (*of the ship*)—Description of the midship section—Description of the longitudinal section—The stocks—The cradle—and the launch of a 74-gun ship.

BEFORE entering upon a description of the grand old ships of war in which Rodney, Howe, Jervis, and Nelson achieved such successes over the enemies of Great Britain, I will endeavour to enlist the attention of my readers whilst I give a short description of some of the most famous of those in use by our forefathers; which, although highly prized and admired in their day, would present a strange contrast, were it possible that any of them could be placed alongside one of the present.

Alfred was the first English monarch who established a fleet of war vessels to resist the invasion of the Danes. William the Conqueror had a fleet of 500 vessels in the year 1065. Nine ships of larger size were built by Richard I. for his expedition to the Holy Land; and the royal fleet in the reign of Edward I. consisted of 710 vessels in 1344. The bowsprit was added to ships of war during the reign of Edward III. Port-holes were first introduced by French ship-builders in 1500.

A ship, called the *Great Harry*, was built in 1488, and is stated to be the first three-masted ship of the Royal Navy; and, as late as the year 1545, appears to have been the only ship of that description in the English fleet. It is supposed she was accidentally burnt in 1553 at Woolwich; so that she was in existence 65 years.

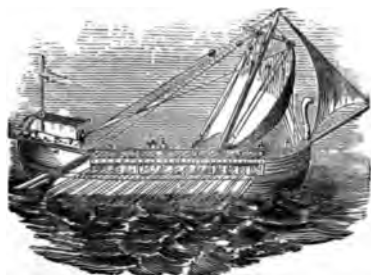
Historians agree in giving the honour of establishing the constitution of the present Royal Navy to Henry VIII. He instituted an Admiralty and a Navy Office, with Commissioners, and fixed regular salaries for them, as well as for his admirals, officers, and sailors; and the sea-service thenceforward became a distinct profession.

The cannon or guns used by both Richard III. and Henry VII., in their men-of-war (all single-masted ships), were of a rude description; and as their ships had no port-holes, they were mounted so as to fire over the bulwark or side of the ship, with the exception of the *Great Harry*, which had two decks, when port-holes were of course introduced.

The next large ship of which we have any account was one built in the year 1515, at Erith, a small town on the Kentish shore, between London and Gravesend, and is said to have measured about 1,000 tons burthen; she was called the *Henri-Grace-à-Dieu*, and carried about 80 guns of various sizes. She was the first three-decked ship built in England, and had four masts. Her name was changed to the *Edward* in 1552, but no record exists of her after-fate. This ship had two whole battery-decks, and a short one, or platform at the head, which was raised very high, whence probably arose the name fore-castle, which is given to that part of the ship; and a similar short raised deck at the stern, called the poop. Upon these decks guns were also used.

The next ship of any note was the *Souveraine of the Seas*; she was the largest of all that preceded her, and was built at Woolwich Dockyard in the year 1637. This ship had three battery or gun decks, with additional platforms or short decks at the head and stern. She carried about 100 guns, and was estimated at 1,680 tons burthen.

The first classification of the ships of the Navy appears to have been in 1546. They were then 58 in number; the first class being called "shyppes," the



GALLEAS.

second "galleases," the third "pynnaces," and the fourth "roo-baerges," or row-barges. Now, all the ships built before the *Great Harry* had but one mast and one sail; these must, therefore, have formed the first class. The galleas was probably a low, long vessel, propelled by oars as well as sails, perhaps not fixed to the mast, or any standing yard, but merely hoisted from the deck as occasion required. The "pynnace," or pinnacle, was probably a smaller kind of galleas, without any mast, or else a moveable one. And the "roo-baerge," or row-barge, was a still smaller boat, of course without any sails.

In the reign of Charles I. the British Navy was divided into six rates, the same as in the present day; each rate consisted of two classes, to which different complements of men were assigned.

In the year 1688 we have the first introduction of bombs and fireships into this country. The Bomb was a vessel carrying six or eight small guns, and two heavy mortars for throwing shells into a town or fortification, or otherwise annoying an enemy. This was the invention of a Frenchman of the name of Rayneau, and first employed at the bombardment of Algiers, in the year 1681.

Fire-ships are small vessels filled with combustible and explosive materials, which are sent into the midst of an enemy's fleet, where they are ignited by a train, and are pretty certain to cause the destruction of some of them. The fire-ship I shall allude to hereafter, when a more particular description will be given.

From this period successive improvements were made, both in the form and rigging of the ships ; the high platform at the head of the ship was done away with, though the name forecastle is still retained.

At the death of George I., in 1727, the number of ships was 178, the rates of which were thus divided :—

First-rates, from 100 guns upwards, burthens about 1,900 tons.					
Second	„	90 and below 100	„	„	1,600 „
Third	„	70 „ 90	„	from 1,200 to 1,400 tons.	
Fourth	„	50 „ 70	„	„	800 „ 1,000 „
Fifth	„	30 „ 50	„	„	400 „ 600 „
Sixth	„	20 „ 30	„	„	400 „

The term frigate appears to have been first applied to ships of war by the English ; and, in fact, almost all English merchant-ships were called frigates about the middle of the sixteenth century ; and, curious as it may appear, we have an account in 1588, of a merchant-ship being hired, called the Frigate *Elizabeth Fonnes*, as one of the ships serving with Sir Francis Drake. This ship was only 80 tons burthen, and carried 50 men.

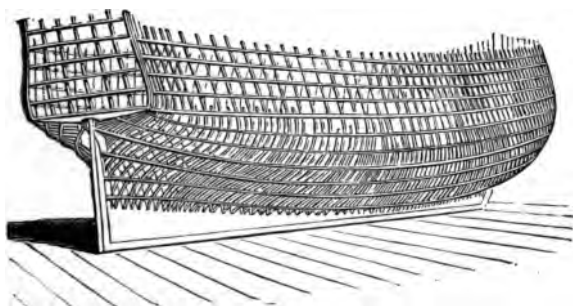
Having stated thus much of the shipping used in the olden time, I will now describe a first-rate of my young days ; and, in order that my young readers may fully understand this description, I will give an enlarged sketch of the principal parts, with figures or reference letters attached, and to each part its proper name will be assigned. In order that too much should not be crowding upon your minds at the same time—in which case you would

gain but an imperfect comprehension of the subject, if any at all—I will explain and dispose of each drawing separately ; merely hinting here that very careful attention to these explanations is absolutely necessary, that you may understand the meaning of orders given by the captain and officers, when I relate my voyages.

I will commence with the drawing of a ship in frame, which shows the main timbers of the hull, before any of the planking is laid on.

I have in this drawing omitted showing the stocks, and what is called the cradle, as they would have interfered with the view of some part of the ship's framework, and will be afterwards more particularly explained when describing the launch, in which both the stocks and the cradle are shown.

The whole length of the keel is supported on blocks of



THE FRAMEWORK OF THE PRINCE OF WALES.

wood placed across, between the stocks or ways. On the top of the keel, branch out on each side, long, bent,

square timbers, called the ribs, which at the lower part, in the middle of the ship, form nearly a quarter of a circle on each side, and are afterwards carried nearly upright. Upon these timbers, where they cross the keel, is laid, in the same direction as the keel, another long square timber, which is called the inner keel, or kelson. The keel and kelson are fastened together at every place where the floor timbers cross them, by iron bolts passed through all. That portion of the ribs which touches and crosses the keel is called the floor timbers. Upon the kelson are the steps of the masts.

The ribs are divided into several parts, which are called futtocks. I will presently describe them. To the ribs the planking is nailed, and bolted through them, after which the seams are caulked. This is done by forcing oakum, saturated in tar and pitch, into the spaces between the planks, when a good coat of tar is laid over the whole. That part of the ship which is always under water is covered with

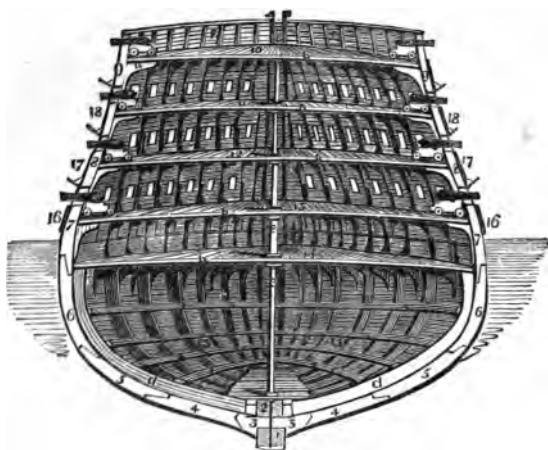


CAULKER.

thin sheets of copper. This is done to prevent the attack of a destructive little animal called the wood-worm, which eats its way into and through the planks, making holes nearly an inch in diameter ; these holes would, by admitting the water into the hold of the ship, very probably cause her loss, as it is impossible to stop the ravages of

force the plank onward, by returning rapidly into the space from which a portion has been removed, to admit the passage of the plank through it. For this reason ship-builders place the broadest part nearer the bow than the stern of the vessel.

The section, called the "midship section," will show



MIDSHIP SECTION.

the disposition of the timbers. Nos. 4, 5, 6, 7, and 8, are the first, second, third, fourth, and fifth futtocks; 9, 9, are the top timbers; 3, 3, are the floor timbers; 2, the keelson, or kelson; 1, the keel below, to which is attached a piece of timber from end to end, called the false keel which is put on to save the main-keel from being rubbed, when the ship may ground, or touch the bottom; *b b b b b* are the beams upon which the deck planks are laid. The

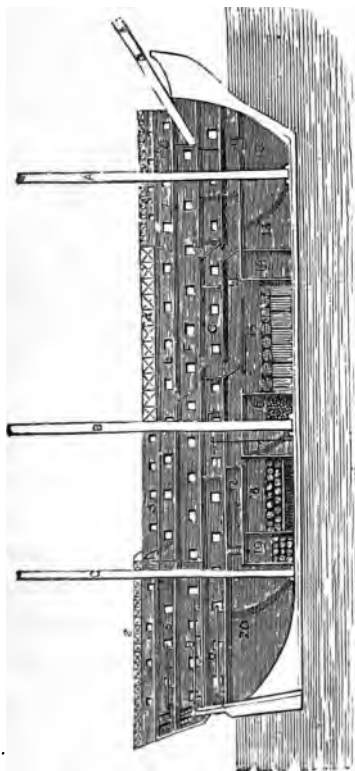
beams are supported and fixed firmly to the side-timbers or ribs of the ship, by means of knees, *a*, which are crooked pieces of oak, and obtained nearly in the shape in which they are used—they are shown under all the decks, adjoining the ship's sides. The New Forest, in Hampshire, is noted for producing the best timber for this purpose. Of late years, however, knees of iron have been substituted for those of wood, as they are found to possess greater strength and occupy less room; besides which, a difficulty sometimes exists of procuring the timber in the shape and size necessary. There are pillars called stanchions, either round or square, run up through the middle of the ship, which form a centre support for the beams and decks. No. 10 is the quarter-deck; 11, the main-deck; 12, the middle-deck; 13, the lower deck; 14, the orlop deck and cockpit; 15, the hold. No. 16 is the main-wales; 17, the middle or sheer-wales; 18, the channel-wales. The wales are extra thick planks, carried the whole length of the ship, to strengthen the planking.

The next drawing I shall describe is called the longitudinal section; it shows the vessel entirely built, with one-half removed, so as to open to view all the interior divisions or compartments.

The following is the explanation of the letters and figures in the drawing:—

A is the foremast, B, the mainmast, C, the mizen-mast, and D, the bowsprit. The masts are carried right through all the decks of the ship and fixed on the keelson; this is called the step of the mast.

I will now go through the decks, commencing with No. 1, in the after part of the ship; this is the captain's



cabin; 2 is the poop, directly over it; 3, the quarter-deck; 4, the waist and gangway; and 5, the forecastle. These are all the divisions on the upper deck, which is the longest in the ship, and measures about 212 feet, by 52 feet wide, The depth of the hold in the middle, or amid-ship, is about 52 feet.

The next deck, with the letter E, is the main-deck; and at No. 6, immediately under the captain's cabin, is the admiral's state cabin. In the fore part of the ship is No. 7, the galley, or cook's room; and No. 8 is the sick-bay. These

are the principal divisions of the main-deck. A portion of this deck, in front of the admiral's cabin, is commonly called the half-deck.

Under the admiral's cabin is the wardroom, No. 9.

where the lieutenants and other commissioned officers mess. This is on the middle deck, and is lettered F, and is the only division on it. G is the lower deck, and No. 10, in the after part, is the gun-room. This is where the sub-lieutenants, some of the midshipmen, the assistant masters, surgeons, and the ship's clerk, mess. No. 11 is the orlop deck; and 12, the cockpit. The following are all in the hold—viz., 13, the boatswain's and carpenter's storerooms; 14, the



QUARTER-DECK.

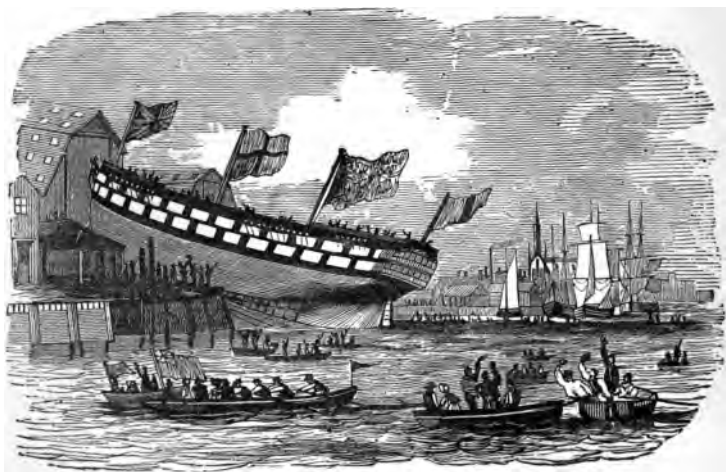


CABIN.

powder magazine; 15, the tanks and water-casks; 16, the shot-well; 17, the pump-well; 18, where beef and pork in casks are kept; 19, the spirit-room; 20, the bread-room. The after magazine is situated under the front of the gun-room.

The ship being finished (excepting the masts, which

are got in afterwards, as I will describe), is now ready to be launched. This is a splendid sight, which generally draws an immense concourse of spectators. Royalty often takes a part in it, the vessel being christened by some member of the royal family. Imagine the ship just

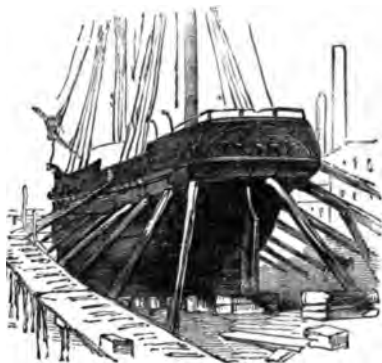


THE LAUNCH.

leaving the stocks, sliding gracefully down, and amidst a deafening cheer entering that element which is to be her after home ; which will bear her, guided by the skilful hand of man, to distant lands ; now, as if caressing her, reflecting the majestic vessel upon its glossy surface ; or rising, urged by the powerful winds, into mighty billows, threatening to engulph the hapless wanderer, or to rend her in pieces, and striking terror into the breast of the mariner !

But perhaps you will ask me how is she launched ? This is a very natural question, as it must be supposed that such a ponderous building, without being fixed in a peculiar manner and with great ingenuity, could never be moved by manual strength. Thus then it is done :—

The stocks on which the ship is built are higher at one end than the other, forming what is called an inclined plane, which is carried out into the water some distance, to allow the vessel to be so far immersed before she leaves their support, as nearly to float her ; when one short plunge takes place, and the proud ship is in her element.



SHORES.

The ship is supported in an upright position on the stocks, or ways, by strong pieces of timber, framed together, called the *cradle*, which is shown under the ship in the launch. The cradle slides down the ways with the ship, until the water renders its longer support unnecessary ; when, by its peculiar construction, it falls to pieces, floats on the water, and is picked up by boats and brought ashore.

She is prevented from sliding down the stocks until entirely ready, by strong timbers, called shores, placed

in a slanting direction, with one end firmly planted in the ground, and the other resting against the hull, or body of the ship ; these shores form supports for the ship's framework whilst building, and, when everything is complete, are all removed. When the launch takes place, the ways are greased to prevent friction, and to allow the ship to pass on freely.

When the last of the shores, called the dog-shores, are removed or knocked away, and, by her own weight, the ship is beginning to move, the christening or naming of the ship takes place, which ceremony is considered to be of great importance, and one that, with line-of-battle and other large ships, is conducted with much form, and generally performed by the fair hand of a lady of exalted rank, in the presence of thousands of spectators.

A bottle of wine, suspended from the ship's bows by a cord, is presented to the lady, who pronounces the ship's name, and dashes it to pieces against the stem or cut-water ; when the ponderous ship rushes down the stocks, and becomes the tenant of the briny ocean. After the launch a sumptuous dinner is generally provided by the builder, to which the owners and friends, if it is a merchant ship or a steamer, do full justice, and at which success to the ship is heartily drunk.



CHAPTER III.

Gives a description of the building-shed—A dry dock—The method of getting the masts on board ; also a list of the officers and men of a first-rate—The sheer-vessel described—The rates of men-of-war—All the standing and some parts of the running rigging of the *Prince of Wales* described.

THE ship being launched into what I have heard called “her native element” (it might be called “her future element” with a better grace), the next subject for consideration is to know how the masts are fixed in their places. This to a landsman must appear a very difficult task, and I have no doubt considerably puzzled the earlier ship-builders. It is plain that for want of height the masts cannot be raised whilst the ship is on the stocks, under the shed which is erected for the purpose of keeping the ship dry whilst building, and to

enable the shipwrights to work in all weathers. This shed is a large roof of woodwork, supported on wood or iron pillars, entirely boarded over, and then covered with canvas, rendered waterproof by a coating of pitch and tar. Light is admitted into the interior through large windows or skylights. Similar roofs are placed over the dry docks.

Now, a dry dock is a very useful thing in a dockyard ; in fact, it could not be dispensed with, and I will tell you



DOCK.

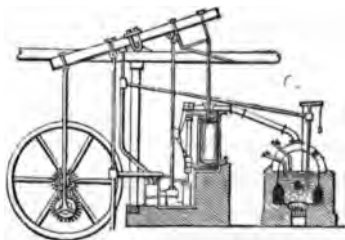
why. You must be aware that it would be quite impossible that a first-rate ship, when in need of repair, could be hauled up on dry ground to allow of its being done, in the manner that boats and small craft are in such cases. To overcome

this difficulty, a space inside a quay or sea-wall is chosen, where there is sufficient water for the ship to approach it ; and this space is excavated to such an extent, both in length and width, as to permit the vessel to float into the opening, with an allowance of room around her for the operations of the workmen. The sides of this space are finished with a wall of masonry ascending by large steps to the top.

The time chosen, both for docking and launching large ships, is high water of spring tides ; at which time the

tide rises considerably higher, and recedes or ebbs to a greater depth, than on ordinary occasions. By taking advantage of this opportunity much labour is saved—for instance :—

We will suppose the ship draws twenty-four feet water (or that she requires twenty-four feet depth of water to float her), the average height, from low to high water of a spring tide, is eighteen feet on our coasts. You will perceive that in addition to this depth, in making the dock, a further depth of six feet must be excavated, to allow the vessel to float into it. This is of considerable importance in another way ; for, when the vessel has floated into the dock, before anything can be done to her, all the water must be removed. Now, eighteen feet in depth will flow out with the receding tide ; and when it is low water, the strong gates fixed at the entrance of the dock are closed, and rendered water-tight, and the space within is thus shut off from the next flowing tide. Hence we have only to dispose of the six feet of water in the bottom of the dock, that is, below the level of low-water mark ; and this is easily removed by pumps, worked either by a steam-engine or by manual labour.



CONDENSING STEAM-ENGINE.

We will now return to the ship, which is still waiting to have her masts on board. For this purpose she is either

taken alongside a sheer-hulk, or into a dry dock, by the side of which are erected shears. A very fine specimen of the latter machinery is to be seen at Woolwich Dock-yard. Before the ship is rigged, the captain and most of the crew are appointed, as the men have to assist in rigging her. I therefore subjoin—

A list of the Officers and Men forming the Crew of an old First-rate, or ship of 100 to 120 guns, arranged according to their Rank and Rate of Pay.

Captain	1	Boatswain's mates	8
Lieutenants	8	Captains of fore-castle	3
Master	1	Captain of hold	1
Chaplain	1	Ship's cook	1
Surgeon	1	Sailmaker	1
Purser	1	Ropemaker	1
Second-master	1	Carpenter's mates	2
Assistant-surgeons	3	Caulker	1
Gunner	1	Armourer	1
Boatswain	1	Captains of main-top	3
Carpenter	1	Ditto fore-top	3
Mate	1	Ditto mizen-top	3
Midshipmen	23	Ditto after guard	3
Master's assistants	6	Yeoman of signals	1
Schoolmaster	1	Coxswain of the pinnace	1
Clerk	1	Sailmaker's mate	1
Master-at-arms	1	Caulker's ditto	1
Ship's corporals	2	Armourer's mates	2
Captain's coxswain	1	Cooper	1
Launch ditto	1	Volunteers	12
Quartermasters	12	Gunner's crew	25
Gunner's mates	5	Carpenter's ditto	18

Sailmaker's crew 2	Boys 32
Cooper's ditto 2	
Yeoman of storeroom 1	Total 690
Able-bodied and ordinary seamen 478	
Cook's mate 1	MARINES.
Barber 1	Captain of marines 1
Purser's steward 1	Lieutenants 3
Captain's ditto 1	Sergeants 4
Ditto cook 1	Corporals 4
Wardroom ditto 1	Drummers 2
Ditto steward 1	Privates 146
Steward's mate 1	Grand total 850

In second-rates the total amount is	675 men.
Third ditto	625 ditto.
Fourth ditto	400 ditto.
Fifth ditto	290 ditto.
Sixth ditto	140 ditto.

In sea-going ships, particularly in war-time, a great many officers and men are taken out as supernumeraries, who are either to be drafted into other ships in foreign ports that may need them, or to fill up vacancies occasioned by death or losses in action. A first-rate may have supernumeraries to the number of 200 or 300.


It has been ascertained that the weight of an old seventy-four-gun ship, including the hull, rigging, guns, stores, officers, and men, together with six months' provisions, amounted to about 2,800 tons ; and the quantity of water displaced when the ship is afloat is equal to about 100,000 cubic feet.

The weight and displacement of water, as given in the seventy-four, which is a third-rate, will be proportionably increased or decreased in all the other rates; and it would be unnecessary to give a detail of them.

But will not some of my readers say with astonishment, "Is it possible that so many as 850 or 1,000 people can be lodged in one ship? Why, she must be as large as a little town; and how is it possible that any sea could ever injure her?" But such is the case; and, though she is thronged with people, yet the admirable order and regularity in which everything is conducted, preserves her from many of the disasters to which smaller ships with fewer hands are subject.

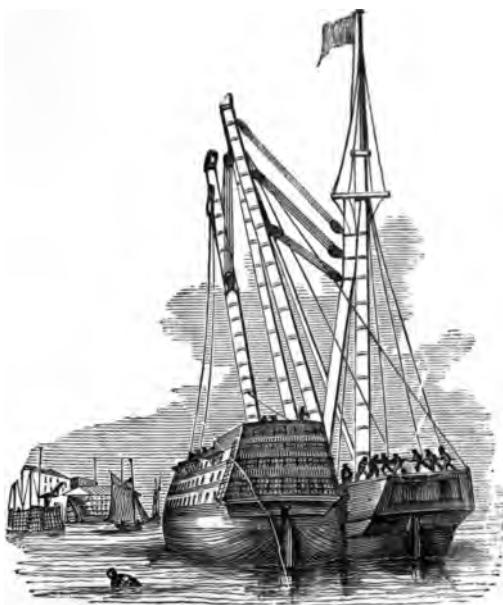
The *Prince of Wales* was taken alongside the sheer-hulk to get her masts hoisted in. The sheer-hulk is a large strongly-built vessel, well moored by strong chains in a convenient spot on the water where any ship can approach her.

This vessel is fitted with a strong perpendicular mast; and two others, called the shears, fixed on pivots or hinges to strong framework on the deck, as shown in the drawing. The upper ends, meeting in a point, are suspended by strong tackle from the mast-head in a slanting direction, leaning to such a distance over the side of the hulk, as to hold the mast to be fixed in the ship alongside her, directly over the holes in the decks, when they are lowered into their places and fixed tight with wedges. Of course, it is only the lower masts that require the adoption of this method to fix them in their places; and



when their great length and consequent weight are considered, it is very certain none better could be used.

The length of the mainmast is about 150 feet from the keel to the cap; the main-topmast is 66 feet; and above



ALONGSIDE THE SHEER-HULK.

it the main-top-gallant-mast, 44 feet, being altogether about 260 feet, from which, if we deduct 52 feet, the depth of the hull, we have left 208 feet, the height of the mainmast above the deck. In light winds royal and sky-sail masts are set, which will add from 30 to 40 feet to its height; these are at the discretion of the captain.

The foremast is in all its parts proportionately shorter than the mainmast, and the mizen is also still proportionately shorter than the foremast.

These last dimensions being given for a first-rate, of course all the other rates will have each dimension decreased in proportion to their size.*

The different rates formerly were as follows :—

First-rates are ships from	...	120	to	100	guns.
Second ditto	..... do.	...	100	„	90 „
Third ditto	..... do.	...	84	„	60 „
Fourth ditto	..... do.	...	60	„	44 „
Fifth ditto	..... do.	...	44	„	28 „
Sixth ditto are sloops of war and brigs ;	after these come				
	schooners, cutters, gun-boats, &c., which are not rated.				
Fourth-rates are called first-class frigates.					
Fifth ditto,	ditto,	second ditto.			

Having got the masts on board, it will now be necessary for me to describe some part of the rigging, and also the means that are used for setting it up. I will, therefore, describe this generally by the drawing or diagram of the ship rigged ; and of any part that requires it, I will give a separate and fuller description afterwards.

Description of Mast and Rigging of 120 gun Ship, with their proper and general names.

A The foremast	F Fore-yard
B Fore-topmast	G Mainmast
C Fore-top-gallant-mast	H Main-topmast
D Fore-top-gallant-yard	I Main-top-gallant-mast
E Fore-topsail-yard	J Main-top-gallant-yard

* For modern rating, see end of volume.

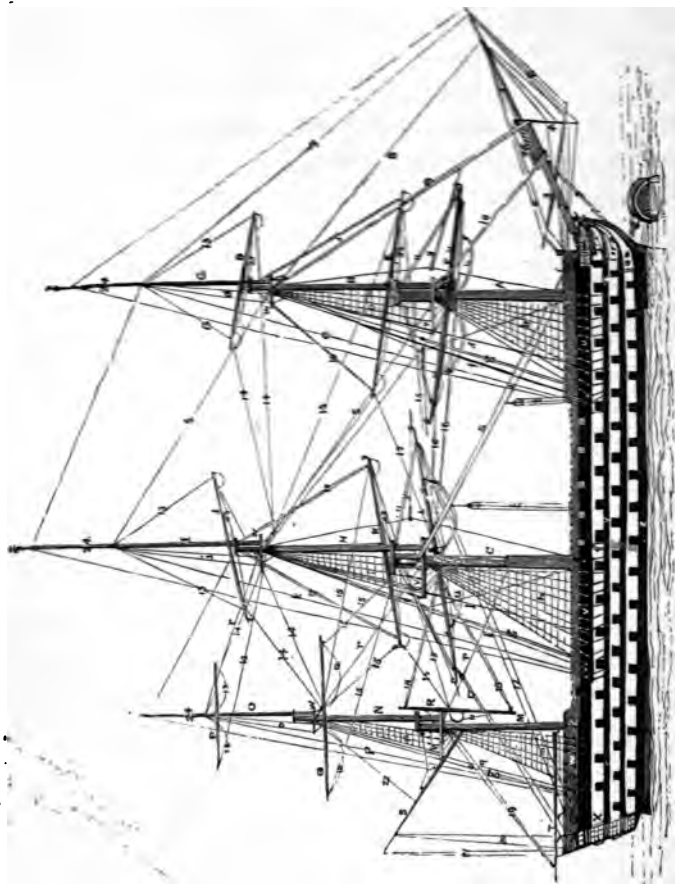


DIAGRAM OF RIGGING (OLD).

K Main-topsail-yard
L Main-yard
M Mizemast
N Mizen-topmast
O Mizen-top-gallant-mast
P Mizen-top-gallant-yard
Q Mizen-topsail-yard
R Cross-jack-yard
S The gaff
T The spanker boom
U The fore chains, or channels
V The main ditto
W The mizen ditto
X The quarter galleries
Y The chain or channel-wales
Z The main channel-wales

p Mizen top-gallant back-stay
q Ditto, topmast ditto
r r r Mizen. mizen-top, and mizen-top-gallant stays
s s s Main, ditto, ditto
t t Stay tackles
u u Fore and main-yard tackles
v v v Fore, main, and mizen-tops (round tops)
w w w Fore, main, and mizen cross-trees
x x x Fore, main, and mizen-trucks
y y Stunsail, or studding-sail booms, on the fore and main-yards.

a The cutwater and figure-head
b The fore shrouds and ratlines
c Ditto, topmast ditto
d Top-gallant shrouds
e Top-gallant back-stay
f Topmast back-stay
g g g Topsail ties
h Main shrouds, &c., or main rigging
i Ditto, topmast ditto
j Ditto, top-gallant ditto
k Ditto, ditto, back-stay
l Ditto, topmast ditto
m Mizen shrouds
n Ditto, topmast ditto
o Ditto, top-gallant ditto

1 The jib-boom
2 Bowsprit
3 Sprit-sail-yard
4 Dolphin-strikers
5 Bob-stays
6 Jib-boom, guys, and stays
7 Fore-top-gallant stay
8 Jib-stay
9 Fore-topmast-stay
10 Fore-stay
11 11 11 Lifts of the fore, main, and mizen-yards
12 12 12 Ditto, ditto, topsail-yards
13 13 13 Ditto, ditto, top-gallant-yards

14	14	Fore, main, and mizen-top-gallant braces	19	Topping lift
15	15	Ditto, ditto, ditto, topsail ditto	20	Vangs
16	16	Fore braces	21	Signal halliards
17	17	Main ditto	22	Peak, or gaff halliards
18	18	Cross-jack-yard braces	23	Foot-ropes
			24	Fore, main, and mizen-royals

The plate represents the ship moored to a buoy by what is called a bridle, which is simply a rope passed through the ring of the buoy and then secured on board.

An attentive examination of this figure with the foregoing list will make the young reader familiar with the names of the different parts of the standing rigging, and such parts of the running rigging as are shown—viz., the braces, lifts, &c. It will be observed that the head-yards, or those upon the foremast, are braced up to the left hand (or to port, as it is called by sailors), in order to show the front or fore part of the yard with the jack-stay, which is an iron rod fastened at certain distances to the yard by a kind of eye-bolt, a small space being left between it and the yard to admit of the head of the sail being attached by means of small cords called rope-bands or robins. This act of fastening the sail is called bending it, and cutting them away and taking down the sail is called unbending it. All the square sails are fastened in this manner.

The stay-sails and jibs are fastened to small rings or hoops, which travel freely on their respective stays, and admit of the sails being hoisted up, or set, or of being

hauled down, as occasion may require. But the head of the driver, or spanker, is fastened to the gaff by a rope passed through holes in the top of the sail and laced round the gaff.

The main-yard is braced up to the right hand, or to starboard, and shows the after or hind part of the yard ; and the mizen, or, as it is generally called, the cross-jack-yard, is topped up and down (raised in an upright position), and shows the method of fastening it to the mast. This fastening is of iron, and works on joints in the centre of the circular part, to admit of its being topped up and down, and at the same time to allow the yard to be braced fore and aft ; and its semicircular form is adapted, to allow the topmast to pass through it when hoisted or lowered as it may be necessary. The fore and main-yards are fixed in a similar way.

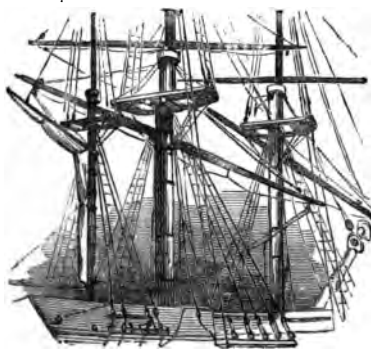
The fore and main-top and top-gallant-yards are shown lowered on to their respective caps, and are then said to be hanging in the lifts, which are seen drawn tight (or taut, to use a sailor's term).

The mizen-top and top-gallant-yards are shown set up to their respective mast-heads, and are held by the halliards ; in which case the lifts hang slack, as shown. The stunsail-booms are drawn on the fore and main-yards only, but they are set in the same manner on all the other yards. The royals have all stays and shrouds, and sometimes cross-trees, similar to the topmast cross-trees ; these are called the top-gallant cross-trees.

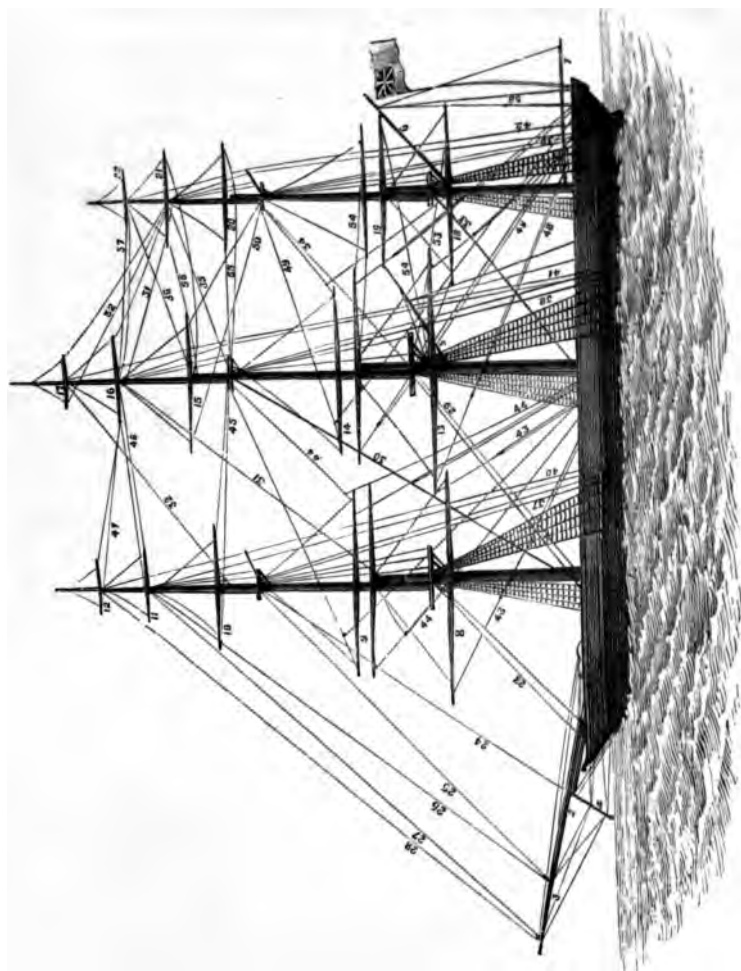
In contrast to the rigging of 120-gun ship when Grandpa

was at sea, I here give you a diagram of a modern ship with

REFERENCE.—1 Bowsprit, 2 Jib-boom, 3 Flying Jib-boom, 4 Martingale, 5 Main Try-sail Gaff, 6 Spanker Gaff, 7 Spanker Boom, 8 Fore-yard, 9 Fore-top-sail-yards, 10 Fore T'Gallant-yard, 11 Fore Royal-yard, 12 Fore Sky-sail-yard, 13 Main-yard, 14 Main Top-sail-yards, 15 Main T'Gallant-yard, 16 Main Royal-yard, 17 Main Sky-sail-yard, 18 Cro'jack-yard, 19 Mizzen Top-sail-yards, 20 Mizzen T'Gallant-yard, 21 Mizzen Royal-yard, 22 Mizzen Sky-sail-yard, 23 Fore Stays, 24 Fore Topmast Stay, 25 Jib Stay, 26 Fore T'Gallant Stay, 27 Flying Jib Stay, 28 Fore Royal Stay, 29 Main Stays, 30 Main Topmast Stay, 31 Main T'Gallant Stay, 32 Main Royal Stay, 33 Mizzen Stay, 34 Mizzen Top-mast Stay, 35 Mizzen T'Gallant Stay, 36 Mizzen Royal Stay, 37, 38, 39 Fore, Main, and Mizzen Topmast Back-stays, 40, 41, 42 Fore, Main, and Mizzen T'Gallant, and Royal Back-stays, 43 Fore Braces, 44, Fore Top-sail Braces, 45 Fore T'Gallant Braces, 46 Fore Royal Braces, 47 Fore Sky-sail Braces, 48 Main Braces, 49 Main Top-sail Braces, 50 Main T'Gallant Braces, 51 Main Royal Braces, 52 Main Sky-sail Braces, 53 Cro'jack Braces, 54 Mizzen Top-sail Braces, 55 Mizzen T'Gallant Braces, 56, Mizzen Royal Braces, 57 Mizzen Sky-sail Braces, 58 Spanker Vangs.



RIGGING.



PIAGRAM OF RIGGING (NEW).



SAILYARD.

CHAPTER IV.

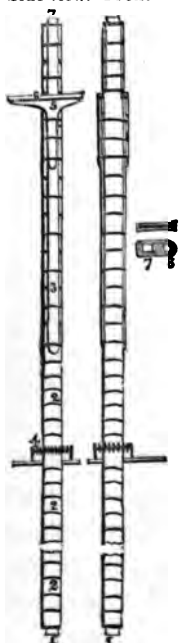
Description of a mast—A topmast—How it is hoisted—The main-truck, or the leap for life—The top-gallant-mast—Royal and sky-sail masts—Method of supporting the masts—The shrouds—The channels—The knight-heads—The ratlines—Tackles—The bowsprit—The jib-boom—The danger of a ship, if any accident happens to her bowsprit.

I TRUST the general description I have given of a ship, and the principal parts of her rigging, has not been lost on my readers ; if they have been as much interested in reading it as I have been in writing it, they will be better prepared to listen or read with interest a description of the manner in which the different parts are put together, and the names of those different parts. It is of the greatest importance that these be composed of the very

best materials and workmanship, to enable the ship to withstand the enormous strain she is subjected to. I will now commence with the masts.

A mast is composed of several pieces of timber, which are worked to fit close, and then bound together by stout iron hoops, driven on whilst hot; as the metal in cooling contracts considerably, and thus compresses the pieces of timber closer together.

Side view. Front view.



The explanation of the figures in the diagram is as follows:—No. 1 is the heel or step of the mast (fixed on the kelson); 2, the mast; 3, the woldings (stout timbers placed on each side of the mast to strengthen it, and likewise bound with iron hoops); 4, the bits and belaying-pins, placed around the mast a little above the deck, with uprights supporting them from the deck; these are for the purpose of fixing or fastening (belaying is the sea phrase) some portions of the running rigging, such as the rolling tackles, the halliards, the clue-lines, &c.; 5, the chocks (timbers to support the trussel-trees); 6, the trussel-trees, which form a base for the framework of the round-top; 7, the head of the mast, showing square to receive the cap.

The cap is drawn on its side, in order to show the square hole, 7, which fits the head of the mast, and the round

hole, 8, through which the topmast is to slide up and down. The figure above it shows the edge of the cap as it would appear fixed in its place.

The other figure represents a front view of the mast, showing the edge of the woldings on each side of it.

An alteration in the vertical position of the masts will materially affect the sailing of a vessel. To allow this alteration to be made without disturbing the rigging, the holes in the deck are made larger than the masts, and the spaces filled up by wedges driven tight all round it ; the mast may, therefore, be inclined either to the fore or after part of the ship, as the case may require, by altering these wedges.



MAST.

If the head of the mast inclined much off the perpendicular towards the stern, the sea phrase would be, "the mast rakes very much aft ;" and when perfectly upright, or a little inclining to the bow, the mast would be said to be upright, or to have a forward rake.

Very lofty masts are said to be "very taunt."

When a ship has her top-gallant, royal, and sky-sail-masts aloft, she is said to be rigged "all-a-taunt-o."

If a sailor, in speaking of a ship, says "she has very square yards," he means that she has very long ones ; the

term square having no reference to the form of the yard, which is actually a round spar.

A topmast is hoisted in the following manner, which will be shown by the accompanying figure, in which No. 1 is the lower mast. A rope, 8, called a mast-rope, is passed from the deck up the side of the mast, and through a block under the cap, 9, then through the hole in the top (which receives the head of the topmast), whence it is lowered and passed through a sheave at the heel or end of the topmast resting on the deck, and conducted up the opposite side of the mast, and fixed to an eye-bolt under the cap, directly opposite to the block. It is then hove (hailed)

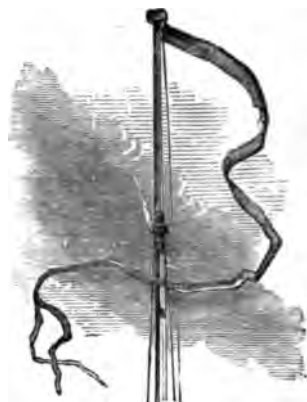


TOPMAST AND
YARD.

up to its place, either by men stationed on the deck, or by the capstan, and is prevented from sliding down again by the fids, which are pieces of wood or iron, passed through the hole near the lower end of the topmast, 7, and resting on the round-top. The mast-rope is then unrove, and put in store till required again. The topmast passes through the round hole in the cap before mentioned, and is secured by strong ropes or shrouds fixed to the rim or outer edge of the cap, and by back-stays leading to the sides of the ship, abaft the rigging of their respective shrouds.

The topmast, though much smaller than the mast, is a very large spar, and the lower part is generally framed

together. On the head of the topmast is also a cap, and a little below it are the topmost cross-trees, to receive the top-gallant-mast, which is hoisted and secured like a topmast. On the top of the top-gallant-mast is the truck, in which are sheaves, to admit a rope or halliard, for hoisting a flag or pennant. When royals are hoisted, the truck is removed, and a cap and cross-trees fixed, called the top-gallant cross-trees, through which the royal-mast is hoisted. Sometimes the royal and sky-sail masts



PENNANT.

are all in one, and set without cross-trees ; the heel of the royal-mast is then lashed to the top-gallant-mast.

The following circumstance, mentioned in Captain Basil Hall's works, occurred on board a frigate lying at anchor at a port of general rendezvous, and place of refitting, for our squadrons in the Mediterranean :—

THE MAIN-TRUCK, OR THE LEAP FOR LIFE.

“The frigate requiring repairs, we dismantled the ship completely, broke out all her stores, and, indeed, gave her a complete overhaul.

“Many hands make light work ; and in a few days we had made everything ship-shape again. And to make

her look taunt, we had set up very long royal and sky-sail-poles, that gave the ship a very dashy appearance.

“The water of this beautiful inlet, which, though it makes about four miles inland, is not much more than a quarter of a mile in width, is seldom ruffled by a storm, and, on the delightful afternoon to which I now refer, lay as still and unbroken as a mirror, except when disturbed by the paddles of some passing waterman.



FRIGATE.

“What little wind there had been in the fore part of the day, died away at noon ; and, though the first dog-watch was almost out (that is, it was nearly six o'clock), and the sun near the horizon, not a breath of air had risen to disturb the deep serenity of the scene. A Dutch liner (line-of-battle ship), which lay in the bay not far from us, was so clearly reflected in the glassy surface of the water, that there was not a rope about her, from her main-stay to her signal-halliards, which the eye could not distinctly trace in her shadowy and inverted image.

"A small polacca craft had got under weigh, intending to stand over to the coast of Spain; but it fell dead calm just before she reached the mouth of the harbour, and there she lay as motionless upon the dark blue surface as if she had been only part of a mimic scene from the pencil of an accomplished painter. Her broad lateen sails, as they hung drooping from the slanting and taper yards, shone with a glistening whiteness, that contrasted beautifully with the dark flood in which they were reflected. The walls of the various buildings lay, some in shadow, and others were lit up by the sun till they shone like silver. On the opposite side, the ruins of a fort dimly seen made up the picture.

"On board our vessel unusual stillness prevailed. The spar-deck (in the waist) was almost deserted. The quartermaster of the watch, with his spy-glass in his hand, and dressed in a frock and trousers of snowy whiteness, stood aft on the taffrail, motionless as a statue, keeping the usual look-out. Some sailors were lounging under the shade of the bulwarks, on the fo'castle and along the gangway, and all variously employed.

"On the top of the boom-cover (also in the waist), in the full glare of the level sun, lay Black Jake, the jig-maker of the ship, his flat nose dilated to unusual width, and his ebony cheeks fairly glistening with delight, as he looked up at the gambols of a large monkey, which, clinging to the main-stay, just above Jake's woolly head, was chattering and grinning back at the negro, as if there existed some means of mutual intelligence between them.

“By this kind of manœuvring, the animal enticed little Bob up to the royal-mast-head, when, springing suddenly on to the royal-stay, it ran nimbly down to the fore-to'-gallant-mast-head, thence to the fore-top, and out to the end of the yard, when he hung the cap upon the stunsail-boom-iron, chattering as if in exultation.

“Bob, who by this time was completely tired out with his exertions, sat down on the royal cross-trees, while those who had been attracted by the sport resumed their usual occupations or amusements.

“The monkey, no longer the object of pursuit, soon took up the cap, returned in towards the slings (at the middle of the yard), and dropped it upon deck.

“Some little piece of duty occurred at this moment to engage me for a few minutes, and as soon as it was performed I walked aft, thinking no more of the circumstance, when I was aroused by a cry from Black Jake.

“‘Look, look! Massa Scupper,’ cried he; ‘Massa Stay is on de main-truck.’

“A cold shudder ran through my veins at the word. I cast my eyes up—it was too true. The adventurous boy, after resting himself, had taken the whim of climbing the sky-sail-pole, and was actually standing on the main-truck! It was comparatively easy to ascend; but to descend—my head swam round, and my stomach felt sick, at the thought of the perils comprised in that one word. There was nothing above him or around him but empty air, and beneath him a mere point—a small unstable wheel. If he should attempt to stoop, what could

he lay hold of to steady his descent? What was to be done? To hail him, and inform him of his danger, would be but to insure his destruction. Every moment I expected the fatal catastrophe. I could not bear to look at him, and yet could not withdraw my gaze. The intelligence of poor Bob's temerity had spread through the ship like wildfire, and the officers and crew were all crowding to the deck. Every one, as he looked up, turned pale; no one made any suggestion; no one spoke. Every feeling, every faculty, seemed absorbed and swallowed up in one deep, intense emotion of agony. Once the first lieutenant seized the trumpet, as if to hail poor Bob, but he had scarcely raised it to his lips, when his arm dropped again, and sunk listlessly down beside him, as if from sad consciousness of the inutility of what he had been going to say. Every soul in the ship was now on the spar-deck (in the waist), and every eye was fixed on the main-truck.

"At that moment there was a stir among the crew about the gangway; and directly after, another face was added to those on the quarter-deck: it was the commodore, Bob's father.

"He had come alongside in a shore-boat, without having been noticed by a single eye, so intense and universal was the interest that had fastened every gaze upon the spot where poor Bob stood trembling, on the awful verge of fate.

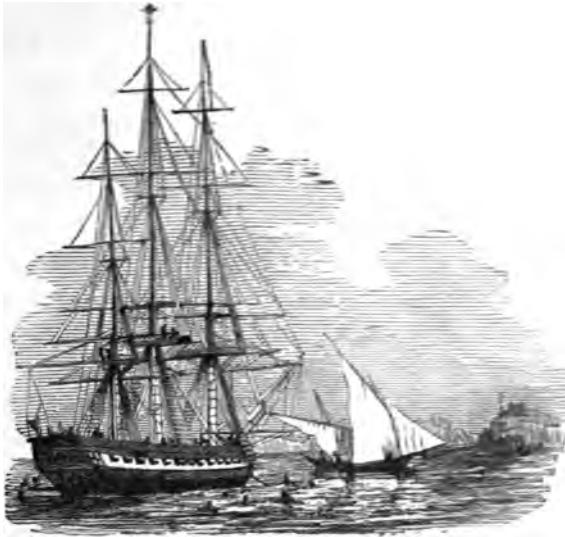
"The commodore asked not a question, uttered not a syllable. He was a dark-faced, austere man; and it was

thought by some of the midshipmen that he entertained but little affection for his son. However that might have been, it is certain that he treated him with precisely the same strict discipline that he maintained towards the other young officers ; or, if there was any difference at all, it was not in favour of Bob. Some, who pretended to have studied his character closely, affirmed that he loved his boy too well to spoil him ; and that, intending him for the arduous profession in which he had himself risen to fame and eminence, he thought it would be of service to him to experience some of its privations and hardships at the outset.

“The arrival of the commodore changed the direction of several eyes, which turned on him, to trace what emotion the danger of his son would occasion. But their scrutiny was foiled. By no outward sign did he show what was passing within. His eye still retained its severe expression, his brow the slight frown which it usually wore, and his lip its haughty curl. Immediately on reaching the deck, he had ordered a marine to hand him a musket ; and with this, stepping aft, and getting on the look-out block, at the traffrail, he raised it to his shoulder, and took deliberate aim at his son, at the same time hailing him, without a trumpet, in his voice of thunder—‘Robert,’ cried he, ‘jump! jump overboard or I’ll fire at you.’

“The boy seemed to hesitate; and it was plain that he was tottering, for his arms were thrown out like those of one scarcely able to retain his balance. The commo-

dore raised his voice again, and, in a quicker and more energetic tone, cried, 'Jump! 'tis your only chance for life.'



"The words were scarcely out of his mouth before the boy was seen to leave the truck, and spring out into the air. A sound, between a shriek and a groan, burst from many lips. The father spoke not, sighed not—indeed he did not seem to breathe. For a moment of intense interest, a pin might have been heard to drop on deck. With a rush like that of a cannon-ball, the body descended to the water; and before the waves closed over it, twenty stout fellows, among them several officers,

had dived from the bulwarks. Another short period of anxious suspense ensued. He rose—he was alive! His arms were seen to move!—he struck out towards the ship!—and, despite the discipline of a man-of-war, three loud huzzas, an outburst of unfeigned and unrestrainable joy from the hearts of our crew of five hundred men, pealed through the air, and made the welkin ring.

“Till this moment the old commodore had stood unmoved. The eyes that, glistening with joy, now sought his face, saw that it was ashy pale. He attempted to descend the look-out block, but his knees bent under him; he seemed to gasp for breath, and put up his hand, as if to tear open his breast; but, before he accomplished his object, he staggered forward, and would have fallen on the deck, had he not been caught by old Black Jake. He was borne into his cabin, where the surgeon attended him, whose utmost skill was required to restore his mind to its usual equability and self-command, in which he at last happily succeeded. As soon as he recovered from the dreadful shock, he sent for Bob, and had a long confidential conference with him; and it was noticed, when the little fellow left the cabin, that he was in tears.

“The next day we sent down our taunt and dashy poles, and replaced them with the stump-to'-gallant-masts; and on the third, we weighed anchor, and made sail for Gibraltar.”

And now to return to our subject:—

The main and foremasts are supported each by ten or

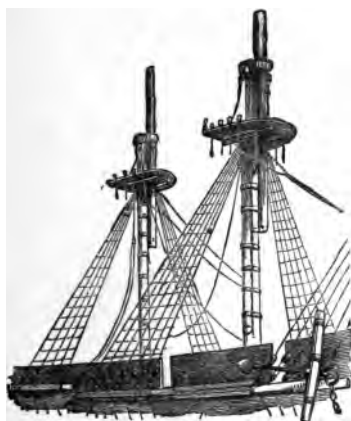
twelve large ropes on either side, called the shrouds, and the mizen by six or eight, which are put on in pairs, a pair on each side, alternately. The shrouds, being first made the proper length, are doubled, and a loop or space, of sufficient dimensions to pass over the head of the mast, is made on the middle part, by lashing or serving it round with small ropes, or spunyarn. At the ends are fixed dead-eyes (circular blocks with three holes in each). On the outside of the ship are projecting boards, called channels, or, in the sea phrase, "the chains." On the outer edge of the channels are fixed dead-eyes, similar to those in the ends of the shrouds. A small rope, called a lanyard, is then rove through both, and drawn taut (tight), when the shroud appears as shown in this drawing; in which No. 1 is placed at the dead-eye at the end of the shroud; 2, at the lanyard; 3, on the channel; 4, on the chain-plate firmly attached to the side of the ship, 5, and to the bend (ring) of iron, which holds the dead-eye, and comes through the channel itself; 6 is on the ship's bulwarks.



The ratlines, or rattlings, are small ropes worked across the shrouds, to form a kind of step-ladder, by which the seamen can go aloft.

A rope is said to be rove when it is passed through a block, whether single or double, where it works freely

with the sheave or sheaves in the centre, and is ready for use. Fig. 1 represents a single sheave block with the



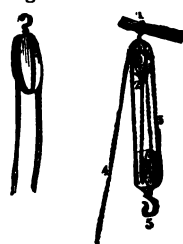
THE RATLINES.

rope rove through it; and fig. 2 is two double blocks, such as are used for boat-tackles, &c. (hoisting and lowering boats). No. 1 is a spar to which one block may be attached, by a piece of rope or a strap passing round it; 2 is the rope made fast to the under part of the block, and called the standing part; 3 is the rope passed through each block alternately; 4 is the fall, or that

part which is pulled by the men, in order to raise a weight which may be attached to the hook, 5, under the lower block. The part of the rope between the two blocks is sometimes called the bight.

Having now described the method of fixing the shrouds, both to the top of the mast and to the sides of the vessel, which form supports for the masts in this position (namely, across the ship), I will now describe the fore and aft supports, which mainly depend upon the bowsprit, as my readers will see clearly if they follow me through this description.

Fig. 1.

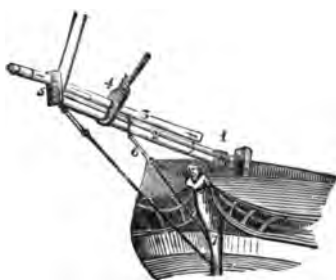


I will, therefore, give a few particulars respecting the bowsprit.

The heel or step of the bowsprit is fixed to strong timbers or stanchions, either on the lower or the main-deck, and passes between strong timbers in the head, called the knightheads. It is secured by rope or chain lashings passed round it, and through holes in the knee of the head, which is called the gammoning. It is further secured by one or two strong ropes or chains, called bobstays.

Explanation of the figure.

No. 1, the gammoning ; 2, the bowsprit ; 3, the jib-boom ; 4, the end or heart of the forestay ; 5, the cap ; 6, the bobstays ; one fixed near the heart of the forestay, and the other under the cap, and both to the ship's stem or cutwater, 7, and hove taut (pulled tight), in a similar way to the shrouds, by the lanyards.



Two or more ropes, called shrouds or guys, lead from the end or cap of the bowsprit, and are fixed on each side the bows of the ship. The jib-boom, as well as the bowsprit, are round spars, the latter being composed of several pieces framed together like a mast. The jib-boom passes through the heart of the forestay and the cap, and is secured by a fid, like a topmast, and is further supported by guys (ropes) passing from the end, through the ends of the spritsail-yard, and fixed to

the head of the ship, as shown in the diagram of rigging (which see at p. 51).

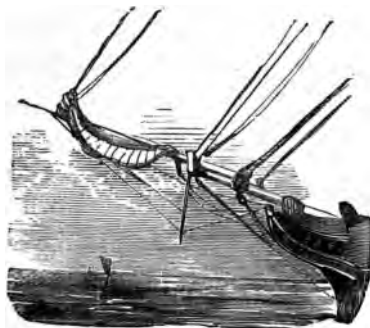
To the bowsprit and jib-boom are fixed the ends of the forestay, the fore-topmast-stay, jib-stay, &c. ; these are essential supports for the foremast ; for, if any accident happened to the bowsprit, the fore-topmast would be in danger of falling ; and, for this reason :—suppose the bowsprit to be broken off (or, as sailors say, “carried away”) just without the gammoning ; the foremast instantly loses the support of the forestay, the fore-topmast of its stay, and the fore-top-gallant-mast of its stay also, as these were fixed to the bowsprit and jib-boom. The fore-topmast with all its gear (spars or yards, sails, and rigging) is sure to be carried away, if the foremast does not go altogether ; and as the main-top-gallant-mast is stayed to the fore-topmast in a similar way, it is likely to share the same fate.

Now, as such an accident as I have mentioned does not often occur but in tempestuous weather, when one ship may run foul of another, and thus create the injury, a ship so circumstanced is in the greatest possible danger, for, if the foremast goes over the side, the main-topmast with all its gear follows, and with it is carried away the mizen-top-gallant-mast. But perhaps it might have been necessary before this to cut away the mizen-mast, in order to wear the ship. She would, consequently, have nothing but the mainmast standing, and would be like a log on the water, entirely at the mercy of the wind and waves.

Although every part of the ship's framework may be

sound and perfect when the accident happened, it would not long remain so; as she would roll, and strain her timbers most tremendously, and in all probability spring a leak, if not several. In such a case, no time should be lost in getting up a large spar, in the place of the fore-mast (called a jury-mast), upon which a sail may be hoisted, to set the ship before the wind. But, as I shall have occasion to describe a case, in one of my voyages, wherein jury-masts were required, I will not now go further into the subject, but return to the descriptions.





BOWSPRIT.

CHAPTER V.

The fore-stay—The round-tops and their uses—Description of the mizen-top—
The cross-trees—Method of hoisting the lower yards—The *Prince of Wales*
going to sea—Her sails described.

IF you have followed my description carefully, you will know a great deal more about a ship and her rigging than it was possible for any youngster to know when I was one, unless they resided in a seaport. I have said that the heart of the fore-stay is fixed to the bowsprit; the other end is carried to the head of the foremast, and passed round it, in the form of a loop, called a crowfoot, resting on the top of the shrouds, at the round-top. There are three tops, called the fore, main, and mizen-tops respectively.

The round-top is a strong framework of timber, projecting considerably (in proportion to the size of the vessel) from the mast, of which the trussel-trees before mentioned form the base. Its use is for spreading the topmast rigging. The tops are the particular stations of some of the best seamen in the ships, who are called captains of the tops; in a first-rate there are three to each.

In engagements, the tops are frequently used as stations for the marines, who fire from them upon the enemy's deck.

It was from the main-top of the *Bucentaur* (a French ship), at the battle of Trafalgar, in October, 1805, that the heroic Nelson received his death-wound.

It is also in the tops, and on the lower and top-gallant-yards of the fore and mainmasts, two to each, that the look-out men are placed; and when the young middies (midshipmen) have got into disgrace, it is here, or to the cross-trees above that they are sent for punishment, when commanded to go to the mast-head, and wait until the officer whom they have offended sends for them. Here the mids very frequently take a long snooze; they are not liable to fall off whilst asleep, as there are nettings all round, and they know how to keep themselves warm in cold weather by wrapping themselves in a spare sail. The round-top in a first-rate is very capacious, and will contain forty or fifty men. The topmast shrouds are fixed to the edge or rim of the top as before stated, and from the places where they are fixed are other short

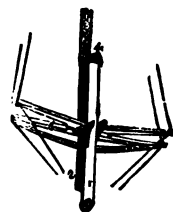
shrouds, called futtock or catharpin shrouds, which are either fixed on to the lower rigging, or passed through it, and attached to the mast itself.



This drawing represents the mizen-top. No. 1, the mizen-mast; 2, the trysail-mast; 3, the gaff (in the two last, the mizen differs from the other masts, on account of a different sail called a spanker being hoisted here, as will be hereafter explained); 4, the trussel-trees; 5, the top; 6, the top-rail (the space between this and the rim is netted or canvassed across); 7, the topmast shrouds and ratlines; 8, the cap; and 9, the topmast.

The trysail-mast is a round spar, set up at the after side of the mizen, for the end of the gaff, which is hollowed out with what are called jaws to fit it, to slide up and down upon.

The annexed sketch is a representation of the cross-trees; in which No. 1 is the topmast; 2, the fid-hole of the top-gallant-mast; 3, the cross-trees; 4, the cap; 5, the top-gallant-mast; and 6, the trussel-trees under the cross-trees. The top-gallant-masts are supported by shrouds, similar to the other masts, with this exception, they have no ratlines; and when the men have to get above this rigging, they climb up by the shrouds, or any rope that may be near them. This Jack would call "shinning aloft, hand over hand."



You may rely upon it, it is easier to come down than to get up by such means, particularly without a little practice.

The lower yards are hoisted by the jears, very strong tackle, the fall of which is brought down to a capstan on the quarter-deck, and there hove upon, until the yard is in its place, where it is held by the slings and the truss (a double-jointed support of iron, which admits the yard to be braced fore and aft ; or, to be raised perpendicular, when it is said to be topped up and down). The semi-circular form of the truss, as denoted at figure 4, in the drawing attached to the description of the topmast (page 58), is adapted to allow the topmast to slide up and down through it, as occasion may require.

When the yard is fixed in its place, the jear-tackles are belayed to the bits on the mast, and when at sea are unrove and stowed away.

Most of the heavy spars are raised aloft by the jear-tackles and the capstan.

The ropes at each end of all the yards, leading in a fore-and-aft direction, are called braces ; it is by the braces that the yards are moved either to starboard or to port. Each has a separate name, applying to the yard to which it is fixed, thus ; those to the fore-yard are called the fore-braces, and those to the main-yard are the main-braces, and so on.

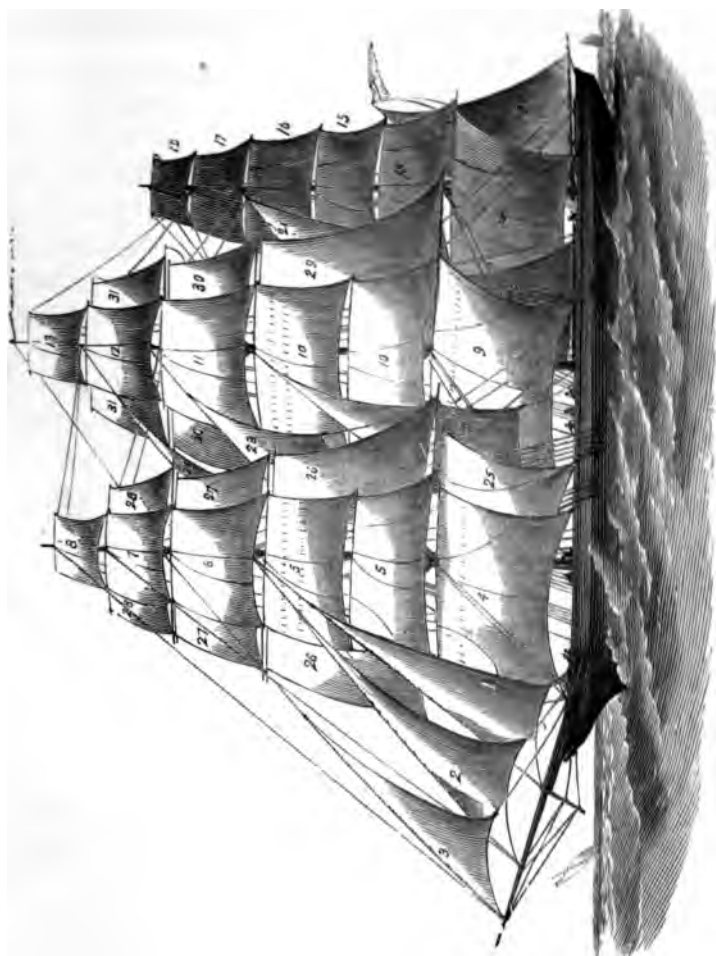
Those ropes, also, at each end of the different yards, which lead to the caps of the respective masts to which the yards are attached, are called lifts, and are desig-

Considering the vast improvement that has been made in the rigging and sailing of ships, it would scarcely be fair to my young friends if I were not to show them a large ship of the present time in full sail, with the names of the various sails now in use :—

REFERENCE.—1 Fore Topmast Staysail ; 2 Jib ; 3 Flying Jib ; 4 Foresail ; 5 Fore Topsails, upper and lower ; 6 Fore T'Gallant-sail ; 7 Fore Royal ; 8 Fore Sky-sail ; 9 Mainsail ; 10 Maintop-sails, upper and lower ; 11 Main T'Gallant-sail ; 12 Main Royal ; 13 Main Sky-sail ; 14 Cro'jack ; 15 Mizzen Topsails, upper and lower ; 16 Mizzen T'Gallant-sail ; 17 Mizzen Royal ; 18 Mizzen Sky-sail ; 19 Spanker ; 20 Main Trysail ; 21 Mizzen T'Gallant Stay-sail ; 22 Main Topmast Stay-sail ; 23 Main T'Gallant Stay-sail ; 24 Main Royal Stay-sail ; 25 Fore Lower Stun'-sail ; 26 Fore Topmast Stun'-sails ; 27 Fore T'Gallant Stun'-sails ; 28 Fore Royal Stun'-sail ; 29 Main Topmast Stun'-sail ; 30 Main T'Gallant Stun'-sails ; 31 Main Royal Stun'-sails.



SPAR.



SHIP IN FULL SAIL



CHAPTER VI.

Contains a description of the anchors—Letting go the anchor—The bits—The stoppers—Weighing the anchor—The messenger, and hauling in the cable—The nippers—The capstan—Cables—Ropes—Chain cables—The Indiaman losing her anchor—The windlass—The anchor—In what manner the anchor holds the ship.

I DO not know if you have ever seen an anchor-smith's forge. It is a most interesting sight. The huge pieces of iron are moved by means of a crane, and many men

are employed with sledge-hammers, which they wield with dexterity, keeping perfect time in their strokes. Large ships have several anchors, of which the best bower and the sheet are the largest, weighing from four and a half to five tons each.

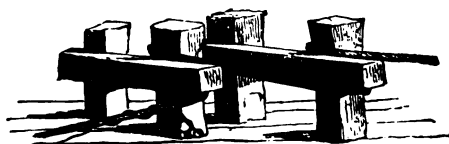
The cathead (No. 1), to which the best bower is hanging, is a very strong beam of timber projecting from the ship's bows, the outward extremity of which is pierced with several slits, in each of which a sheave works, and a rope is rove through them and a corresponding number of sheaves in a large block (No. 2), called the cat-block, to which a large hook (No. 3) is attached. When the anchor is raised above water, the hook (No. 3) is inserted



in the ring ; it is then lifted by the tackle up to the cathead, as shown in the annexed sketch, and it is said to hang a "cock-bill;" but when the fish-hook or ropes (No. 7), are passed round the shank (No. 5), and the anchor is drawn up into a horizontal position along the side of the ship, a chain, called a shank-painter, is passed round it and secured in board, when the anchor is said to be "catted and fished." No. 4 is the anchor-stock ; 5, the shank ; 6, the flukes ; 8, the cable ; and 9, the ship's side. The best bower and sheet anchors are on the starboard side ; the small bower and the stream, on the port. When at sea the anchors are stowed at and abaft the fore-rigging. Besides the above are the kedje and spare anchors, supplied according to the size of the ship,

which are stowed below. On the opposite side of the ship, similarly fixed, is another cathead.

When a ship is coming to an anchor, some portion of her sails are taken in before she reaches her anchoring ground, to reduce her way (motion through the water) gradually, until she stops. When the anchor is let go, the cable runs out with tremendous velocity, and would go much farther than necessary, but for contrivances called stoppers, a species of tackle which is made fast to the bits, or elsewhere. (The stopper is shown in the

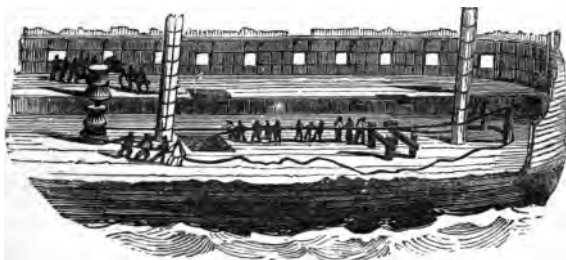


drawing, at the left-hand bit, near the deck.) The stoppers are passed round the cable while it is running out, and tightened by men pulling or hauling upon them, so as first to check it, and eventually stop it altogether. The cable is twisted round a very strong timber framing, called the bits, as shown in the drawing.

When it is required to weigh the anchor preparatory to sailing on a voyage, the cable is got in by means of a strong rope called the messenger.

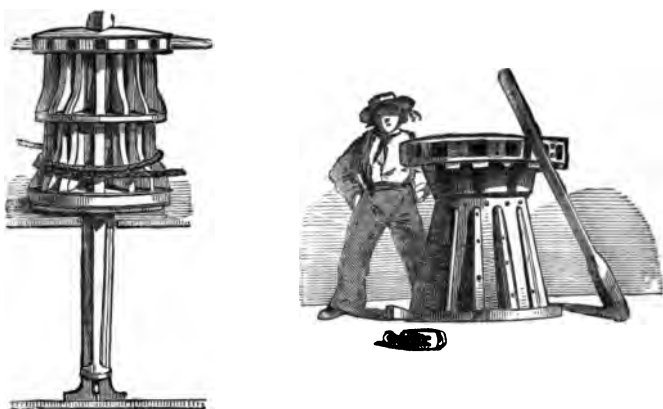
The messenger is an endless rope or hawser, passed two or three times round the capstan, and carried forward through that part of the ship called the manger, where it travels round strong stanchions upon rollers. It acts in the following manner :—A number of boys are

employed to hold several lengths of limp rope called nippers, which are twisted round both cable and messenger by men stationed at the bits upon which the cable presses, effectually preventing the cable from slipping. As the capstan is turned round by the men working on the bars on the deck above (as shown in the drawing), the messenger is kept constantly revolving—the boys holding the nippers, following it as far as the main hatchway, where the cable, as it is drawn in with it, is passed down, and stowed in the cable tier on the orlop



deck. As the boys with each nipper reach the combings (edge) of the hatchway, they instantly uncoil it, and run forward to have it again applied by the men, ready for them to proceed with it as soon as the next set of boys, with their nipper, have made room for them. The slack part of the messenger is held on by men, as it is unwound from the capstan, to prevent it slipping back again. By this continued action the cable is drawn in and coiled down, until the anchor is above water, when it is "catted and fished" as before described.

On board large ships, besides the main capstan, are others called the jear capstans, used for lighter work, such as hoisting the lower yards, top-masts, topsail-yards, &c. A capstan is a strong machine, working on pivots, in an upright position. In the holes around the top, called the drum-head, strong bars are inserted, and several men are placed at each, who keep walking round, pushing the bars, to the sound of drum and fife. In large




THE CAPSTAN.

merchant-ships, a fiddler is placed near the capstan, who plays a song tune, the men joining in chorus. The holes of the capstan are frequently made the repositories of some of the sailors' property, such as spare shoes, quids of tobacco, pipes, and a variety of similar articles.

When the cable is passed through the hawse-holes in the bows of the ship, and attached to the ring of the anchor, preparatory to letting it go, it is said to be "bent."

Cables are of various sizes, and some are as much as 25 inches in circumference, and are thence called 25-inch cables. These cables are 100 fathoms long, weigh nearly six tons, and are worth more than £400. In a cable of this size there are upwards of 3,240 yarns.

All cables and ropes are designated by their circumference, as a 12-inch, a 7-inch, a 3½-inch rope, &c. ; and the smallest ropes are called lines, of which last signal halliards, &c., are made. Of late years chain cables have been used instead of the immense ropes above described.

They consist of a series of links, thus : 

These occupy less room in stowage, are more easily managed than the cumbrous rope cables, and are of equal if not greater strength.

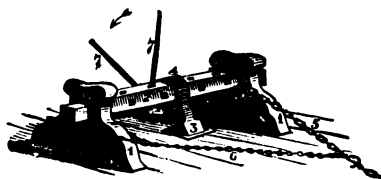
When ships bound on long voyages get into blue water—that is, out of soundings—the anchors are stowed in their places, the cables unbent, and the hawse-holes stoppered (plugged up), to prevent the water rushing in when pitching in a heavy sea.

The reason why a very strong rope, as I have stated, is used as a messenger for getting the anchor, is, that it has to bear the strain equally with the cable. I recollect an instance which occurred on board a 1,400-ton India-man ; she was a new ship, and, it being her first voyage, of course everything on board was new and of the best quality. She was bound for Calcutta, where she arrived in safety, and anchored off some islands at the bottom of the Bay of Bengal. Shortly after, one of the tremendous gales common to those seas came on, and the capstan

was immediately manned, in order to weigh the anchor ; and, as she had troops on board, the soldiers were put into requisition, and as many as 120 men were heaving at the bars, but to no purpose, as the anchor would not start. After a time the messenger broke or parted. The chief officer, who was an old sailor, immediately said to the captain, " We will, if you please, sir, pass the small bower cable for a messenger." It was done, and with the same result ; for it parted, from the immense strain, and broke off as clean as if cut with a knife. At the moment this occurred one of the officers was passing close to it ; the messenger, in spinning round with the recoil, seized him, whirled him round with frightful velocity, and dragged him forward with it. Every one looked upon him as a dead man, but, strange as it may appear, with the exception of a few bruises, he was not hurt. They were obliged at last to slip the cable (leaving a buoy to mark the spot), as it was evident the anchor was hooked or fouled with a coral rock ; and whether it was afterwards weighed (recovered) I have never ascertained.

In small ships, particularly in the merchant service, instead of the capstan, a windlass is used, of which the annexed drawing is a sketch.

The windlass is a piece of strong timber, supported from the



THE WINDLASS.

deck by other strong timbers, called the bits, in which

it works freely. The cable is passed round, and drawn in by the windlass (No. 2), as it is forced round by men pulling down the handspikes (No. 7), placed in the holes of the windlass, which are shifted as it is moved round. The arrow shows the direction in which the handspikes are moved. The slack of the cable is held on by men, and stowed away below. The windlass is prevented from running back, whilst the handspikes are changed, by the palls (No. 3), which consist of two or more leaves of iron, that fall into iron teeth, round the windlass, at No. 4. Nos. 1, 1, are the bits ; 5, the cable ; and 6, the stopper, a short chain fixed round one of the bits, at the end of which is a claw hook ; and when sufficient cable has run out, this hook is dropped into one of the links, and prevents its going farther.

The power of the windlass is greater than that of the capstan, which is a reason why it is used in small ships, as they have not many hands ; but its operation is not so quick as that of the capstan, from the same cause.

I will give you an instance of its power. In a fine new ship, fitted with a windlass on the most approved principle, it happened, when they wished to weigh the anchor, that it was found to be fouled ; and all their efforts to start it were vain. Still the men kept heaving round the windlass ; and so great was the purchase upon it, that the ship's bows, and almost her figure-head, were dragged down into the water ; but the anchor remained immovable. The captain was loth to lose his cable (a chain one) and his best anchor, without

every effort possible being made to regain it. He therefore set all hands to work to remove every portable weight to the after part of the ship, in order to raise her nose (bow) out of the water again ; as he could not have gone on heaving at the windlass without pulling the ship right into the water. When every weight was removed aft, and the vessel brought nearly on a level, he again set the hands to work upon the windlass ; and, after a time, the anchor started. The recoil was so great as to shake everything on board tremendously, "making all grin again," as Jack would say. When the anchor was drawn to the surface, the fluke that had been fouled was found completely bent back, forming nearly a right angle with the shank. It was of course useless as an anchor ; but the cable being saved, the captain was obliged to be content in having gained thus much. It must have been both a good cable and a good anchor, to stand such a trial.

It is probable some of my readers may say, "I do not exactly understand in what manner the anchor acts, and how so small an object can hold a large body like a first-rate ship of war. I wish Grandpa would tell us in what way this is managed."

Well, I think I will do so, whether they wish it or not ; as to some it may be useful, and it is very simple, when understood, as are, indeed, many other matters.

The anchor, as shown in the sketch, has, at the end of the shank to which the ring is affixed, a strong beam of timber, called the stock, in which the shank is fixed.

This beam is in an opposite direction to the arms and flukes of the anchor, and, with the weight of the cable



THE ANCHOR.

attached to it, is sure to overbalance that of the arms and flukes, and lie lengthways on the ground: one fluke of the anchor is then pointing into the ground, along which it may be dragged for a short distance by the weight of the cable

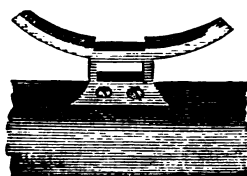
and the drifting of the ship, but burying itself deeper every moment, until firmly embedded, when it holds the ship.

When heavy gales come on, and the holding ground for the anchor is not good, it will sometimes happen that the ship will drift, notwithstanding she may have two or more anchors out; she is then said to be dragging her moorings, as the anchor is all this time trailing along the ground. If some obstacle be not met with in which the anchor may hold, the ship is certain to be driven on shore, if she be near it, and the wind be in that direction, where she will probably be wrecked.

It is very frequently necessary, in heavy gales, to let out two or more cables, of 100 fathoms each, joined together. This quantity of rope or chain, as the case may be, acts as a stay to the anchor, by its weight trailing along the ground, and reduces the probability

of the anchor's starting. This would be called "veering out cable in a gale of wind."

The annexed sketch is a keval or cleat, to which large ropes, such as a main-brace, main-sheets and tacks, &c., are belayed (made fast). They are fixed sometimes to the deck, and to strong stanchions against the bulwarks.



NOTE.—The Porteous Patent Anchor is in many particulars a great improvement on the old anchor, which is, however, still in extensive use with the new anchor, many vessels carrying both.





CHAPTER VII.

Quarter-davits and stern-davits ; their uses—Hoisting on board the large boats, guns, &c.—Armament of 120-gun ship—The rudder, tiller, wheel, compass, and binnacle described—Hammocks.

IT is a matter of the first importance that all the boats necessary for a ship should be good, sound, and so arranged as to be readily accessible in case of need. How often have we read of the miserable policy of keeping the plugs out of the long-boat, launch, or jolly-boat!

This is a very dangerous policy, for should any sudden emergency occur, no one thinks of the plugs, and the boat fills as soon as it is lowered. When ships are about to proceed to sea, their large boats are hoisted on board, and their small ones suspended to davits at the quarter and elsewhere. The boats hung at the quarter are thence called the quarter-boats.

I will now describe the quarter-davits, to which the quarter-boats are attached. There are quarter-davits and stern-davits. In small vessels the lesser boats are generally hoisted at the stern, whence the term stern-davits is applied.

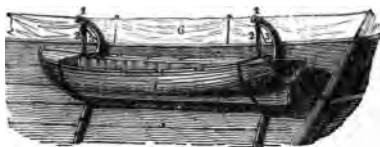


LONG-BOAT.

The davits are generally of iron, and are movable, so as to be unshipped when not required for use. They are made to fit into sockets or eyes attached to the ship's side.

The sketch on the next page is a representation of a quarter-boat, slung in its place on the quarter, near the stern of the ship.

The method of hoisting a boat is as follows :—Bands of rope are passed round it at the head and stern, to



which boat-tackles, as already described, are attached. The upper block of the tackle is slung to the outer end of the davit, and the tackle-fall is carried in board.



YAWL.

Nos. 1, 1 are the davits ; 2, 2, the tackles ; 3, 3, the falls ; 4, the boat ; 5, the ship's side ; and 6, the weather-cloths on the top of the bulwark. The other boats, being much larger, are stowed in board. These comprise the launch, the long-boat, barge, yawl, &c., varying from thirty-six feet in length by ten feet in beam downwards, the launch

being the largest. Some are stowed on the booms in the waist of the ship. (The booms are spare spars kept in case of accidents at sea, and for various other purposes.) The launch, cutter, long-boat, &c., which are, of course, rather heavy, are hoisted on board by means of the stay-tackles before described, which are led out by guys to the yard-arm, so as to hang perpendicularly clear of the ship's side for the purpose. Guns, anchors, and other heavy weights are got in by the same means.

I have now come to the guns and armament.

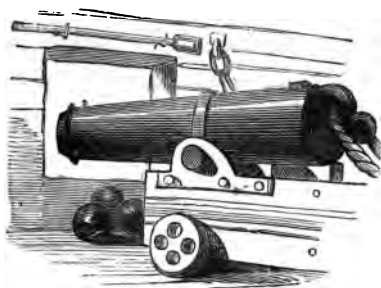
Guns are of various dimensions and calibre, and ships are fitted with them frequently as the taste of the captain may dictate, or the nature of the service she has to perform requires. The following is one list for the armament of a 120-gun ship:—

On the lower-deck	{	30 32-pounders and 2 68-pound carronades
On the middle-deck . . .		34 32-pounders
On the main-deck		34 32-pounders
On the quarter-deck . . .	{	2 18-pounders and 14 32-pound carronades
On the fore-castle	{	2 18-pounders and 2 32-pound carronades
		<hr/> 120

Besides the foregoing are bow and stern-chasers, and, not unfrequently, a bomb or mortar, for throwing shells. The size of a gun is named by the weight of the shot it is fitted to discharge.

It is not necessary, my young readers, that ships in

action should get very close together before they discharge their guns; as a shot will fly through the air upwards of two miles, and take effect: and when it appears to be nearly spent, it would not be a very wise



CARRONADE.

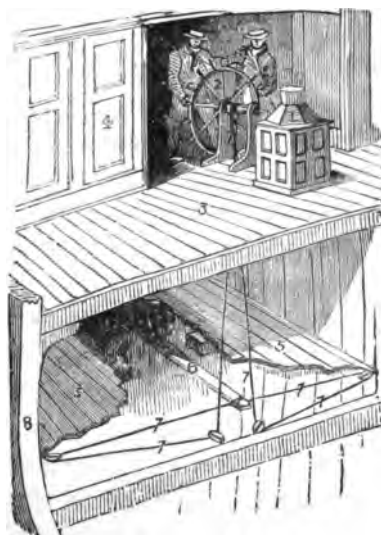
trick in any one to try to stop it with his foot, unless he had no further use for it—his foot, I mean. Many a poor fellow has been knocked down by a spent ball, as it is called, and if not killed, at least very seriously injured.

A very important part in the working of a ship is her rudder. This is at the stern, where it turns on hinges at the stern-post. The annexed drawing is a sketch of one; in which figure 1 is on the rudder; 2, the stern-post; 3, the keel; 4, the ship's counter; and 5, the lower part of the quarter-galleries. The working part of the rudder is under the break of the poop, abaft the quarter-deck.

Here is a small barrel, supported by two uprights, around which ropes, called tiller-



ropes, are wound. Attached to the barrel is a wheel, fitted with spokes, which serve as handles for a man, or men, to turn it, as shown in the sketch below. In all large ships the rudder is thus worked.



The ends of the tiller-rope are conveyed from the barrel of the wheel, down through the intervening decks, and attached to the extremity of the tiller (a horizontal beam fitted on the head of the rudder). The end of the tiller works in a curved socket, along which the tiller-ropes are also led to blocks on each side of the ship; and, when returned to the central blocks, and conveyed up to and around the barrel of the wheel, a continuous line is formed. As the wheel is turned round, an

alteration in the position of the tiller, and consequently of the rudder, takes place ; and, as a part of the tiller-rope is coiled up on the barrel on one side, a corresponding quantity is uncoiled on the other. In the drawing, a portion of the ceiling of the gun-room, or deck of the wardroom, is removed, in order to show clearly the working of the tiller-ropes.

Explanation of the drawing :—No. 1, the binnacle and compass-box ; 2, the wheel ; 3, the quarter-deck ; 4, the bulkheads of the captain's cabin ; 5, 5, portion of the wardroom deck ; 6, the tiller ; 7, the tiller-ropes.

The wheel, as represented, is a double one, the nearer being removed, to show the barrel and tiller-ropes more distinctly.

In fine weather the helm is managed with ease ; the ship's course being given by the master of the ship, the helmsman has only to keep the ship in that course, by the compass fixed in the binnacle immediately in front of him. By night, a lamp is burnt in the binnacle, the light of which is reflected upon the compass below it ; so that the man at the wheel can keep the course ordered, as well at night as by day. If the helm is required to be moved towards that side of the ship on your right, when standing on the quarter-deck, and looking forward, the order given is, "Starboard the helm ;" and if to the left, "Port the helm" would be the command.

In rough weather, the difficulties of steering are generally very great ; and as I have met with a few cases in

my voyages when this has occurred, I will detail those difficulties in my narrative. I will now tell you about the hammocks.

The seamen sleep in hammocks, a kind of bag, open from end to end, made of strong canvas. At each end a number of small lines, called clues, are fastened, and gathered up into a ring, called an eye, and a rope, named a lanyard, is

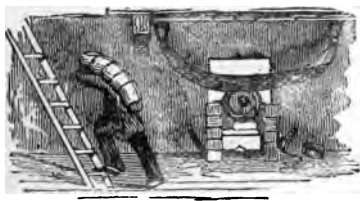


HAMMOCK.

made fast in each, by which it is lashed to the battens, or hooks, as the case may be, fixed under the decks for the purpose, where it swings about with the motion of the ship. The officers have what are called cots, and other contrivances, called standing bed-places.

Every morning, the order, "Lash up and stow hammocks," is given, when each man is allowed five minutes to dress himself and lash up his hammock. At the expiration of the five minutes, the boatswain's whistle is again heard piping "Up all hammocks," when they have to be immediately taken upon deck, preceded by the call of the boatswain's whistle, to command attention, and stowed away for the day in the spaces above the bulwarks, called the hammock-nettings, which are carried all round the ship. Jack, therefore, is obliged to pack

up his bedding in as small a space as possible, and carry



it on deck. At a certain hour in the evening they are all piped down again. Although nearly a thousand men have to get their hammocks, by the order and arrange-

ment that exist, every one being numbered, it is done without either noise or confusion, and the whole business is accomplished in a few minutes. It is rather a curious scene to walk through the decks of a ship after the hammocks have been piped down, and witness the arrangement. On each side of the deck, across and between the guns, are slung the hammocks, fifteen in a row on each side; the width allowed for each man seldom exceeding sixteen inches. It must be observed, however, that only every alternate hammock is occupied at the same time; the owners of the empty ones form the watch—that is, are on deck and elsewhere, performing the duty of the ship.

Until the watch is changed, every vacant hammock is pressed into a very small space by the occupier on each side of it, and sufficient room is gained, which would not be the case but for this arrangement. When the watch is changed the sleepers have to turn out, and their hammocks are compressed in a similar manner. At eight or nine o'clock all lights are put out, and, except those who have the duty of the watch to perform, all hands turn in;

the only lights at this time existing in the ship being those under charge of the sentries, in lanterns. Each sailor has two hammocks (which gives him the opportunity of washing and cleaning one whilst the other is in use) and one set of bedding.

The beautiful lines on sleep, by Shakspeare, are so applicable, that we may be pardoned for inserting them here :

APOSTROPHE TO SLEEP.

Sleep, gentle sleep,
Nature's soft nurse, how have I frighted thee,
That thou no more wilt weigh my eyelids down,
And steep my senses in forgetfulness?
Why rather, sleep, liest thou in smoky cribs,
Upon uneasy pallets stretching thee,
And hush'd with buzzing night-flies to thy slumber;
Than in the perfumed chambers of the great,
Under the costly canopies of state,
And lulled with sounds of sweetest melody?
O thou dull god, why liest thou with the vile
In loathsome beds; and leav'st the kingly couch
A watch-case or a common 'larum bell?
Wilt thou upon the high and giddy mast
Seal up the ship-boy's eyes, and rock his brains
In cradle of the rude imperious surge;
And in the visitation of the winds,
Who take the ruffian billows by the top,
Curling their monstrous heads, and hanging them
With deafening clamours in the slippery clouds,
That, with the hurly,* death itself awakes?
Canst thou, O partial sleep! give thy repose
To the wet sea-boy, in an hour so rude;
And in the calmest and most stillest night,
With all appliances and means to boot,
Deny it to a king?

—*Henry IV., Part II.*

* Noise.



BOATSWAIN AND CREW.

CHAPTER VIII.

The starboard and port watches—First, middle, and morning watches—Dog-watches—Stowage of live stock—A sailor's pets.

IN the management of a ship's crew it is of the utmost importance that the periods of duty and of release from duty be properly defined ; and therefore, in order that the officers and crew of a ship may have their proper hours of labour and of rest, and so be prepared for undertaking the several duties of each according to his vocation, every ship's company is divided into two parties called the starboard and port watches. These perform the whole duty of the ship alternately, each watch continuing four hours. Thus, supposing the port watch to

be called at eight o'clock in the morning, they will continue until twelve o'clock, at which time a bell is struck eight times, and the starboard watch then take their turn of the duty, till four o'clock, when what is called the first dog-watch (the port) commences ; this lasts only two hours, and then the second dog-watch (the starboard), which is also limited to two hours.

After this, namely, at eight o'clock in the evening, commences the first night-watch ; at twelve the middle watch is called ; and at four o'clock the third, or morning watch.

The dog-watches are for the purpose of changing or breaking the watches, so that the middle, or night-duty, shall not fall upon either the starboard or port party twice following, which would be the case without this arrangement ; whereas now, as my readers will perceive by a little calculation, this middle or night watch falls upon the port and starboard watches alternately.

I will now add a few words respecting the stowage of the live stock.

The live stock is for the use of the officers, and paid for out of their own pockets : it consists of cows, sheep, pigs, and poultry.

The cattle and sheep are stowed away upon the main-deck, under the waist, between the guns ; and the pigs in that part of the ship called the manger, on the lower or gun-deck.

The cows are kept in boxes or stalls, the sheep in pens,

in one or two tiers, according to their quantity, and the poultry in hen-coops. The whole are under the charge of the butcher and poulterer, whose duty it is to milk the cows, feed the stock, and kill them as ordered for the service of the officers on board. On board merchant-ships the fowls are placed in hen-coops, round the bulwarks, on the poop, and along the taff-rail; and the cattle are kept under the booms, in the waist, and not unfrequently the long-boat is housed over and battened round the sides, for them to be stowed in. But, on board a line-of-battle ship, such things are not allowed above the main-deck; or else "Jack" would most likely have a pet pig or two running about, which would not be tolerated upon the quarter-deck.

A Jack Tar is not very particular in what he makes a pet of. I have seen lions, bears, and young elephants strolling about the decks of a ship, quite as much at liberty as a Newfoundland dog could have been; and once, when an alligator hunt took place in the East Indies, a number of young ones, about a foot long, were caught, and brought on board by the men for their amusement. After this, I think ladies may pet parrots, spaniels, and even the huge St. Bernard, without much surprise to any one.

What is contained in the preceding pages will, I think, give my readers a good general knowledge of the construction, nature, and properties of a ship. There are, however, many terms and words used by the captain and officers in directing this stupendous effort of the

skill, ingenuity, and perseverance of man across the dark and dreary ocean, of which it is necessary some information should be given. But as a list of these, given separate from the circumstances to which they refer, would most probably be rather dry reading, and, perhaps, uninteresting to you, I will endeavour to embody those most generally in use in the narrative of my voyages, and attach to each, in their proper places, the explanations of them.

I will, therefore, now commence that narrative ; and those of my young readers who have by this time felt an interest in Grandpa Ben, will find some circumstances not unworthy of their notice in the following pages.

"And now, my children," said I, addressing the group around me, "it is time that I conclude my descriptions for this evening. We have had a long spell of it ; and if you are not tired, I must confess that I am ; and it is now getting late. So you must e'en all of you get to the house, where in your beds you may dream of what I have read to you, if you can ; and mind you don't mistake the *main-stay* for the *main-brace*, nor the *topping-lift* for the *topsail-lifts*, or make any other such blunders.

"Instead of your usual lessons, you shall, to-morrow morning, have the diagram of the rigging to study, with the list of names of the masts, yards, and rigging."

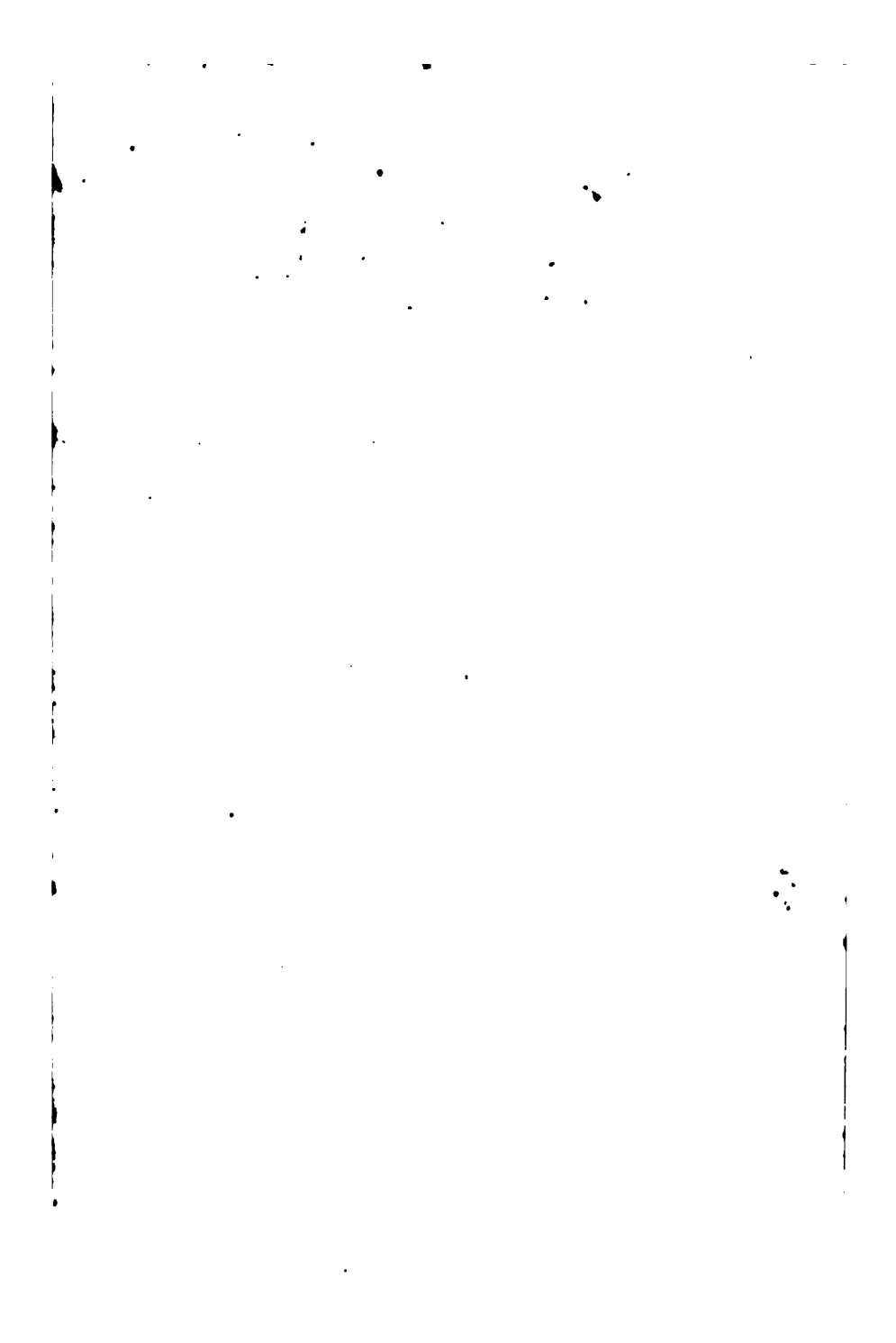
"Thank you, dear Grandpapa," said one and all. "We are much obliged to you for both what you have already told us, and your kind promise for to-morrow. We will

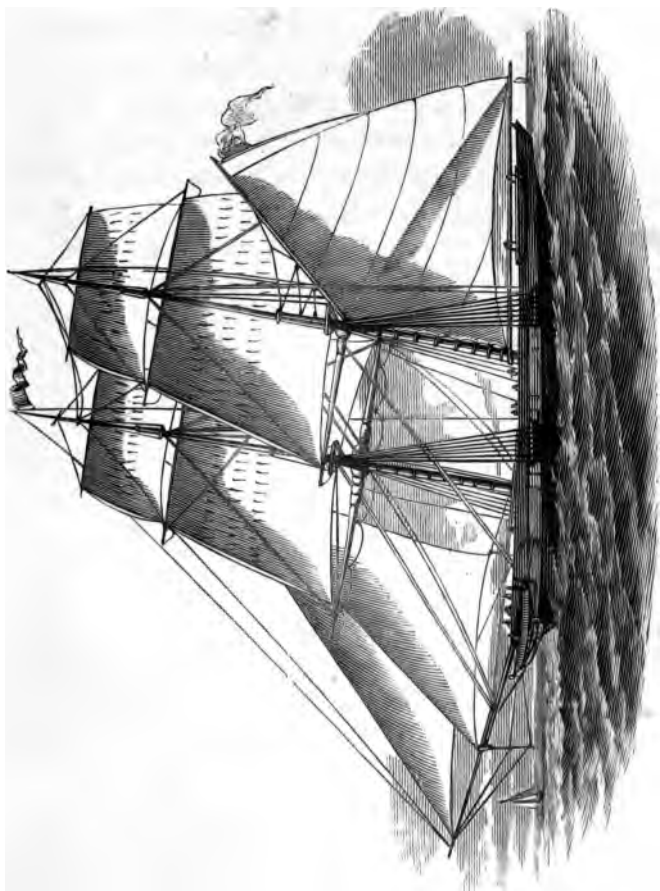
pay most particular attention to it, and endeavour to learn it by heart."

We now returned to the house ; and shortly after the young ones departed to their beds, where I shall leave them, and also my readers, for the present, wishing them " a very good night."



TACKLE.





CLIPPER (OR FAST-SAILING) BRIG.



CHAPTER IX.

Grandpa leaves home, and joins the *Prince of Wales*, as midshipman—Parting with his mother—Departure—Sailing from Portsmouth—Ships in company—Grandpa's messmates—Tom Britain and Charley Stanhope's quarrel—Its happy termination.

I CANNOT tell what may be the feelings of the lads of the future, but in my young days there was so much of the romantic and the daring in the life of a sailor, that

it is scarcely to be wondered at that those living in or near seaports should determine to be sailors. Much of the romance has been done away with by the advent of steam, which, while it adds greatly to the comfort and lessens the hardships of the sailor, has done much to lessen seamanship as exhibited on vessels dependent on wind alone.

I have stated that both my mother and uncle used every argument to induce me to change my intention, but in vain : I was determined to be a sailor, and at length I was sent to my uncle Edward, who at that time was captain of the *Prince of Wales*, of 120 guns. I will pass over my fitting out, and all connected with it ; and now behold me on the deck of this noble ship, dressed as a midshipman, with my dirk belted round me, and my sky-scraper (hat) on ; and quite a man, in my own estimation, though but fourteen summers had yet passed over me. But I should first have told you of the parting with my dear mother, which is even now fresh in my memory ; for it was really our first and last parting. I was absent four years ; but, ere my ship again reached England, death had visited our house, and my dear mother was no more. When I heard this melancholy intelligence, our parting recurred with startling force to my memory ; and the heavy forebodings that had evidently oppressed her mind with the idea that we should meet no more on earth, now hung heavily at my heart, and bitterly I regretted having left her, and the agony I had caused her, parting as she did with her only

child. Her last words will ever remain in my memory as, in trying to soothe her, I exclaimed, "Don't cry dear mother—don't cry ; I shall soon come back, and we shall again be so happy." "Go, my child—my dear boy," replied she, whilst her heart swelled almost to bursting ; "go, my child : I will resign you to the merciful care of that Being who is a Husband to the widow, and a Father to the fatherless."

After my departure, I received a letter from her before we sailed. It inculcated all the moral and religious duties ; requested me to peruse my Bible ; and near the close were the following lines, which I read so often that they became impressed on my memory : they were—

TO MY SAILOR BOY.

When sailing on the ocean,
In foreign climes you roam,
Oh, think with fond emotion
Upon your distant home ;
And never strive to smother,
But treasure up with joy
Remembrance of a mother,
Who loves her Sailor Boy.

When thunders loud are roaring,
And vivid lightning flies,
The rain in torrents pouring,
Sleep will depart my eyes ;
Tears will bedew my pillow,
You all my thoughts employ,
Toss'd on the angry billow,
A little Sailor Boy.

Kind Providence protect you,
And bring you back again ;
Your mother will expect you
Safe from the troubled main.
No, Heav'n will not distress me,
The widow's hope destroy ;
Return once more to bless me,
My little Sailor Boy.

My uncle was a man of kindly and compassionate heart ; and though, before I went to sea with him, I used to play him many a sly trick, and sometimes grieve his spirit, yet he was always lenient to my failings ; and now that he lies in yonder village churchyard, this often causes me a pang of unfeigned contrition for the past.

Long before I became a midshipman, and was placed under his care, it had been my chief delight to hear him tell of the roaring of the guns when ships met in deadly strife, or when the stormy sea, lashed into fury by the howling winds and the raging tempest, threatened destruction to the mariner. And he would so mingle his stories with the generous sympathies of his nature, that many a night has sleep dried the tears from my eyes as I lay on my pillow, after retiring to bed.

We sailed from Portsmouth, and were bound on a three years' cruise. In company were the *Undaunted* frigate, of 36 guns, and the *Termagant*, 16-gun brig, besides a large cutter as a tender.

Who is there that has not exulted in the scene, when the proud ship has spread her canvas to the breeze, to

visit distant lands? Or, when returning to her own home-shores, the gallant tars have

“Hailed each well-known object with delight.”

Scarcely less was the delight of our brave seamen as we passed Spithead on our outward-bound voyage. We were destined for the scene of action, as our country was then at war with France and America ; and many of our gallant fellows were indulging themselves in calculations as to the extent of prize-money they were likely to obtain from the cruise, which some never lived to realize.

It was the first time I had ever been to sea, though I had many times visited my uncle on board when he happened to be in harbour, and I had already learnt a good deal of sailors' language from his coxswain, with whom I had always been a great favourite. For, you must know, the real tar has a language peculiarly his own, and his figures of speech are generally unintelligible to a landsman. For instance, when speaking of a rough dinner, in the preparation of which the cook has not been very careful, Jack will say that he has given him too much galley pepper ;



COXSWAIN.

that is, there is a plentiful supply of cinder-dust instead of the other more seasonable article. In his dress the seaman will give nautical names to every part, calling his body his hull, his clothes his rigging, his hat his truck, and so on.

A new scene was now open before me ; and, as my kind uncle introduced me to my brother midshipmen and fellow-messmates, he privately gave me to understand that I was to conduct myself towards them all as if I had no uncle in the captain, nor relative in any of the officers, which was the case with my messmates, and that I must not expect any more favour from him than each would receive when he conducted himself properly, and the same as I should myself require when placed under the order:—as it was likely I should be one day—of a stranger as captain.

This was very judicious conduct on the part of my uncle, and I assure you he firmly adhered to it ; and if in my folly I ever committed an act that deserved a reprimand, or any other kind of punishment, I was as certain of receiving it as any of my brother mids would be if similarly placed. Thus it became known to all of them that, though the captain's nephew, I was treated like themselves. Any little unfriendly or suspicious feeling that had entered the'r breasts when I first joined them was removed, and we were soon the best of friends ; at least, all who were disposed to be so with me I was glad to treat as such.

We had, however, on board, two mids who had been

schoolfellows, but who, contrary to the general rule in such cases, that "long companionship makes close friends," were constantly quarrelling with each other; and very frequently from words they came to blows, until at length their conduct made them both so disagreeable to the mess that we left them to themselves entirely.

At length a circumstance happened which changed the face of matters; from being the bitterest enemies they became the best friends, and this friendship lasted during their lives; for they were both really good-hearted fellows.

One day, in one of their usual quarrels, which commenced in a mere trifle, one word brought on another till their exasperation had reached its height, when, in the heat of the moment, Tom Britain threw the glass he at the time held in his hand directly in the other's face, inflicting a severe wound, as it broke in pieces.

At this moment Tom was called on deck, and for a time the consequences of this act were prevented; but Charley Stanhope vowed in his own mind he would have sufficient revenge. He kept all to himself, however, and, when his messmate returned, he quitted the mess-table and went on deck.

That same night he put his predetermined retaliation in practice. Retiring to rest with his companions, and waiting till he supposed all were asleep, he rose noiselessly from his hammock, and having ascertained that Tom Britain was in his, and fast asleep—which was proclaimed by his loud snoring—he silently drew forward

towards the head of the hammock one of the seamen's chests that were leaning against the bulkhead ; this he ascended, and with his knife severed the clues or cords by which the hammock was suspended. The unconscious sleeper descended, when his head came in violent contact with the edge of the chest : one deep groan escaped him, and all was quiet—he never moved or spoke, but lay as if dead, with his head resting on the chest and his feet and body suspended by the foot of the hammock, which retained its proper holdfast.

Such serious consequences as this from his revenge had never entered Charley's thoughts. He became dreadfully alarmed ; and having tried to arouse his former enemy—using now the most endearing terms to him, but without effect—the whole force of his folly rushed upon his mind ; and, scarcely knowing what he did, he ran into the cabin of the gunner, exclaiming, "What shall I do, Mr. F——? Come here directly. I believe I have killed poor Tom Britain. What shall I do? Come and help me to raise him."

Mr. F——, with whom Tom was a great favourite, immediately ran to the spot, where he found the poor fellow perfectly insensible, and the blood flowing freely from a wound at the back of his head.

"Oh! say he is not dead," exclaimed Charles, eagerly watching the serious countenance of the gunner. "Oh! tell me he's not dead! I did not mean to hurt him so much when I cut him down. I did not think he would fall so heavily."

"He's not dead, sir," said Mr. F——, "but he is sadly hurt; and I think he will be some time before he recovers this—perhaps some weeks. But I must fetch the doctor as soon as we have got him from the position in which your cruelty and folly have placed him."

Saying this, he raised the head of the unconscious sufferer in his arms, and directed Charles to lower the foot of the hammock to the deck. This was done; and seeing how bitterly the poor boy repented the rash act he had committed, and placing the sufferer in as comfortable a position as he could, with Charles supporting his head, he went to the doctor, reporting on the transaction in as favourable a manner as he could. The doctor immediately came, and having examined the wound and found that no serious consequences would ensue, provided the patient were kept perfectly quiet, he retired; after having stopped the effusion of blood, and directed poor Tom to be immediately put to bed. He, too, was moved by the repentant manner of Charles, and forbore to upbraid him.

Poor Tom remained insensible during the night and part of the following day, and never for one moment was Charles absent from his side. At length the heavy stupor which had chained the faculties of the youth for so long a time was dispelled, and Tom opened his heavy eyes, but for a moment only: he placed his hand to his burning temples, exclaiming, "Oh! my head, my head!"

Charles instantly seized his hand, saying, "Oh! Tom,

forgive me, and never will I offend you by word or deed again. Oh! say you forgive me, Tom."

The youth again opened his eyes, and this time they rested on the countenance of his companion, who was looking in his face, eagerly expecting his answer.

"Where am I?" exclaimed Tom. "What is the matter? What is the meaning of this bandage round my head, which is aching as if it were splitting; and why are you here? What is it all about? Do tell me, Charles."

Charles told him that he had caused it all, and how he had brought this heavy affliction upon him, and earnestly pleaded for forgiveness.

"Charles," said Tom, at length, "we have both been to blame. I remember now that I threw a glass at you, which might have been attended with as bad, if not worse, consequences than those you have caused me; and as I trust we both now see through our folly, pray forgive me as readily as I forgive you, and let us be friends."

"Oh! Tom, you rejoice me much; you have removed a heavy weight from my heart," said Charles, as he shook the hand of the sufferer, rather too roughly for his critical situation; "we will be friends for ever."

Gradually Tom recovered from his mishap, but it was nearly three weeks from the time he received the injury before he was able to return to his duty; and during this time his former foe was his constant companion whenever circumstances would admit. The happy change in both

that had resulted from the circumstance being reported to the captain, he passed the matter over without further notice than merely remarking to them, some short time after, when he saw the two youths pacing the deck arm-in-arm, "Now, my boys, is not this better—more pleasant to your own feelings, and more like the behaviour of gentlemen—than your former ridiculous conduct to each other? I am heartily glad to see you thus: may it continue, and you will be rewarded." So saying, he shook them both warmly by the hand, and the now truly gratified lads passed on.

Thus ended an affair which, in the outset, appeared likely to be a source of annoyance to the whole midshipmen's mess. The circumstance had its due influence on all our minds, and perfect concord and the most gentlemanly conduct existed among all its members; and we had the pleasure of receiving, not only the congratulations of our own captain, but were cited as patterns to copy by other captains who had occasion to find fault with the conduct of their youngest officers.

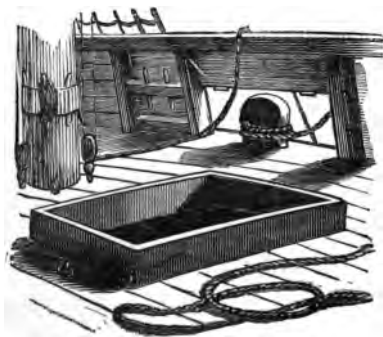
"Keep watch, nor let the burning tide
Of impulse break from all control:
The best of hearts needs pilot-guide,
To steer it clear from error's shoal.

"One wave of passion's boiling flood
May all the sea of life disturb;
And steeds of good but fiery blood
Will rush on death without a curb.

“The coward wretch whose hand and heart
Can bear to torture aught below,
Is ever first to quail and start
From slightest pain, or equal foe.

“Be not too ready to condemn
The wrong thy brothers may have done :
Ere ye too rashly censure them
For human faults, ask—‘Have I none?’”

—ELIZA COOK.





CHAPTER X.

Course through the Bay of Biscay—The soundings that have been obtained there—Mountains and valleys on land and in the sea—Falling in with the *Nero*—A calm—Appearances of the weather—The storm—The cable parted—Guns of distress—Brig ahead—Coming athwart-hawse—Loss of the jib-boom and top-mast, with the hands that were in the rigging—Unsuccessful effort of a sailor to save a boy—The ships separate—A jury top-mast—Frigate weighs anchor, and arrives in port.

THE Bay of Biscay, through which we were proceeding with a favourable breeze, is that part of the Atlantic Ocean which lies between the island of Ushant, in France, and Cape Ortegal, in Spain ; having the Spanish province of Biscay to the south. It washes the whole west coast of France and the north coast of Spain, and receives the waters of the Adour, Charente, Gironde, and Loire. It was in this bay that Lord Howe obtained his memorable victory over the French fleet, June 1, 1794-

In this bay there is always a very heavy swell rolling; and you may have heard, my young readers, that the water is very deep, and also the vulgar belief that it has no bottom. But the latter is too absurd to need a comment from me. It is probable this error arose from the fact, that no length of line that has yet been lowered in it has ever reached the bottom. Scientific men, however, have discussed the subject, and assigned satisfactory reasons for it; and in 1869 Professor Thompson obtained soundings in 2,435 fathoms, equal to 4,870 yards. Much deeper soundings have been taken in other parts of the ocean, especially off the banks of Newfoundland, where a depth has been reached, with the improved sounding apparatus now in use, of more than six miles.

There is no doubt that the bottom of the ocean is varied as much by hills and valleys as the surface of the earth; and that, as your Geography tells you, there are in many parts of the globe mountains measuring about 26,000 feet, or nearly five miles in height, above the level of the sea; so it is likely there are valleys in it of as great, if not a greater, depth; and it has been proved that, as the depth of water increases it becomes more compressed and solid. I will make this more clear to you by asking you a question: How is it that a large piece of timber, which requires the strength of two or three horses to move it on land, if thrown into the water will float?

"Oh," said Edward, "it is very evident, although it does not seem so, that the water is heavier than the wood."

Just so, my boy, such is the case ; the weight, or specific gravity, as it is called, of the water, is greater than the wood, even at its surface. Now you can easily suppose that, at the depth of several hundred feet, the water will be heavier, from the immense pressure that is above it, and the weight of a square foot of it there would be many times the weight of the same quantity at the surface. Thus it may become, at a great depth, sufficiently solid to support the weight of a ship's anchor. Various experiments have been tried to ascertain the pressure of the water at a considerable depth from the surface. An empty tin can, with a weight attached to it, has been lowered, and when drawn up, the sides have been found pressed together as closely as if it had been crushed by a heavy weight falling upon it ; an empty bottle has been lowered, and broken in pieces.

The above, I think, will explain the reason why soundings could not be found in the Bay of Biscay, and various other parts of the ocean, similarly circumstanced as to depth of water, with the old sounding-lines.

As we passed through the Bay, we fell in with a frigate, called the *Nero*, homeward bound. She had encountered severe weather, and had been a good deal knocked about ; but all hands were elated with the prospect of soon seeing their native land—which, alas ! some of them never reached. As the tale may interest you, I will relate what befell her after we parted.

The *Nero* reached the English Channel in safety, and was gradually making her way towards the Downs, when

night and a perfect calm came on ; and, lest she should drift upon the Owers Sands (a dangerous shoal, not far from Spithead), they were obliged to bring up. The sun had gone down in an angry glare of flushing clouds, that crimsoned all the western horizon ; and there was a misty reddish haze gathering in the atmosphere, that betokened a degree of wildness in the signs of the weather. And whether this preluded one of those sudden and violent tempests which sometimes visit the Channel during the summer months, or whether it was caused by the intense heat, and indicated a succession of calms, became a matter of scientific dispute with the seamen, and one in which the oldest officers differed in opinion.

As night advanced, all but the watch retired to rest : towards midnight the sky became dark and lowering, but not a breath of wind ruffled the surface of the silent waters. Suddenly the dense gloom overhead burst asunder with a deafening crash, and sheets of vivid fire lighted up the surrounding ocean, whilst a rushing wind swept through the cordage of the vessel.

In an instant all were alert in the frigate ; but the heavy squall from the south-west caught her, and pressed upon her with such fury, that the cable parted at the hawse-hole (at the bow).

The ship was forced off in the direction of the storm, and the gallant *Nero*, that had so often braved the battle and the breeze, was making rapid progress towards the shoal, and her certain destruction.

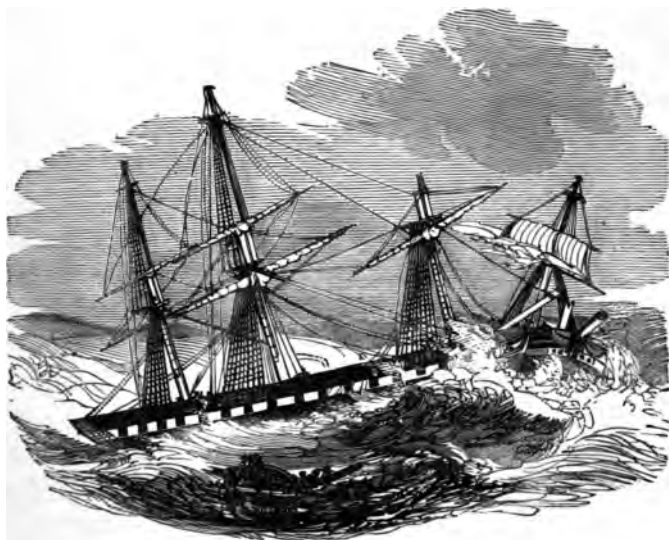
"The cable's parted!" rang through the decks; and all was instant confusion.

At this moment a loud and sonorous voice rose above the howling of the gale, and commanded "Silence!" It was the captain's; and in an instant every tongue was hushed, and not a seaman moved, but in obedience to duty. The men flew to their stations—the frigate's head was once more brought to the wind; and, when the proper moment arrived, the best bower anchor was let go, which fortunately held firmly in the ground.

The darkness was intense; and, to add to the desolate nature of the scene, guns, from some other ships in distress, were heard during the night. It was hoped that from its intense fury the gale would soon wear itself out, when suddenly a fresh object of terror was given to view during a vivid flash of lightning. A large brig was right ahead, and coming directly down upon them.

The captain had seen the brig, and instantly ordered the cable to be cut; but no axe was at hand, and the frigate could not escape. Many men at this moment were aloft, endeavouring to secure the rigging, when the stranger came ploughing up the foam before her. "Fire one of the forecastle guns, and show them lights!" shouted the captain. But whether they saw the one, or heard the other, must be for ever unknown. The brig appeared unmanageable, as she struck the frigate on the bow with a shock so violent that she careened over (turned over nearly on her side); and none, except those who had secured a holdfast, were able to retain their footing on the

deck. The crash was tremendous, and the stranger's fore-mast, with all its weight of top-hamper (spars, sails, and rigging), was carried away over the side. The wind in the after-sails swung her round athwart the frigate's hawse



(right across her bows, as shown in the engraving), breaking the jib-boom of the latter just within the cap, and bringing down with the wreck the fore-top-mast and all its gear (sails and rigging), and precipitating most of the poor fellows, who were on it and the yard, into an ocean grave.

Some of them were good swimmers, and, no doubt, buffeted the waves, as they struggled to retain existence,

although they must have known there was no hope for them.

It must be a fearful thing, my young readers, thus to die, in the midst of health and strength, perhaps unprepared to meet our Maker, and stand before His dread tribunal. Doubtless years of sin and crime crowd upon the faculties of the drowning man with startling force even though bodily weakness may be creeping o'er the frame, till the deep waters close over him, and he is no more.

Amongst the poor fellows was a remarkably fine athletic young man, who had been accustomed to the sea from his infancy ; he rose buoyant and fearless on the surface of the water. A lad of about fourteen years of age had risen by his side, but, being unable to swim, he had caught hold of, and clung to, his companion in distress, so as to endanger the safety of both. The generous seaman would not shake him off, for he was aware there must be some of the wreck of the mast floating near them, and he thought he might find sufficient to make something of a raft ; but the lad encumbered him. "Place your hands on my shoulders," said he to him, "but do not press too heavily, and I will endeavour to save you if I can."

The boy complied, and a blaze of lightning showing the frigate at no great distance, he boldly struck out for her, bearing his burthen lightly ; but the wind was carrying the ship away farther than he calculated, and he found the lad heavily oppress him. Still he persevered ; but his strength was failing him, and he could scarcely raise

himself above the water, on account of the weight of the boy.

"Jem," said he at length, "it is of no use ; I cannot keep afloat much longer with you upon my back. And yet——" He stopped, and again renewed his generous toil ; but a dizziness was creeping over him—he could scarcely keep his chin above the water. "Jem," said he to the poor boy, "we must go ; I cannot bear you any longer. Indeed, Jem, I have done my best ; but we shall both be lost unless——"

The seaman could not conclude, but the boy did for him. "I know it, Harry," responded he. "You have done all you could. And yet it is hard to slip away from life when just at home. My poor mother, Harry ! If you're saved, will you—will you tell her that I prayed for her in my last moments?"

"I will, my boy ; indeed I will. God have mercy on you, Jem, and I trust we shall meet in heaven. It is but a small chance I have, for I am getting very weak," answered the seaman.

"Good bye, Harry," said the lad, as he slid from his companion's shoulders. The latter heard one cry—it was "Mother ! dear mother!"—and he was on the wild waters alone. Consciousness had nearly forsaken him, when he grasped a portion of the wreck, which afforded him rest. He clung to it with desperate energy, was washed over a deep part of the reef, and was picked up the next morning by a fishing-boat, and saved. But to return to the frigate.

The ships lay grinding together, the captain heading his men in the midst of danger, with knives and axes, endeavouring to cut the ships clear. At length they separated, and the brig was discovered the next day ashore on the sands ; but all hands had perished.

The frigate, however, retained her position ; and, as



the gale had considerably abated before morning broke, she was enabled to rig up a jury top-mast, and to fix on to the end of the bowsprit a new jib-boom. In the morning (as they were in a very leaky state, from the violent shock she had received) no time was lost in getting the ship under weigh ; and, by crowding as much sail as the

shattered state of the hull and rigging would allow, she passed the Downs, and proceeded up the river to Chatham Dockyard, where she arrived in safety before the leaks had gained much on them.

I must now, my young readers, return to my own ship, and my narrative.



A POLACCA.



CHAPTER XI.

The trade winds ; their use to sailing ships—Atlantic Ocean—The Gulf Stream
—Loss of the *Atalanta*—Value of discipline—Loss of the *Medusa*—The raft
—Wreck of the *Alceste*.

CONTINUING its course through the tempestuous Bay of Biscay, our little squadron in due time got into the trade winds, or "the trades," as they are generally called.

The trade winds extend between 20° and 80° of west longitude, from the north-west coast of Africa to the east

coast of Central America. It is a remarkable fact that, during one portion of the year, the wind is always blowing in the same direction, both night and day; and for another period, as constantly in the opposite course,—that is, either from west to east, or from east to west. To take advantage of these winds, when going from this country to America, the time generally chosen was when they blow from east to west. Ships then proceed a long way to the southward—almost to Madeira, in order to derive the full benefit of the “trades;” and in returning from America and the West Indies to this part of the world, the time selected was when the wind from west to east prevails.

From the great advantages secured to commerce by these prevailing winds, the name of “the trades” has been given to them.

These winds are caused by the rushing of the colder air from higher latitudes to fill up the space left by the heated and ascending air near the equator. The northern limit of the north-east trade wind is about 29° of north latitude; its southern limit varies from 10° to 12° of north latitude.

We were now steering our way across the Atlantic Ocean. The narrowest part of this great sea, which lies between Europe and Greenland, is upwards of 1,000 miles wide; and, under the northern tropic, it spreads to a breadth of about 4,000 miles, without estimating the Gulf of Mexico, which is of very considerable depth.

From observation, it has been ascertained that a cur-

rent or stream is constantly flowing around this extensive ocean. Its source is in the tropics, and was first noticed in the Gulf of Florida, whence the name of Gulf Stream has been given to it. It travels as much as 15,000 miles, before it again merges into its original source, which it does in about two and a half years. It is various in its progress: in some parts its celerity is as much as eighty miles in twenty-four hours; and in others its rapidity resembles that of a torrent, and is sometimes five miles an hour. This is particularly the case off the Cape of Good Hope, where there is always a very strong current setting to the west, over the Aghullas Bank (an extensive bank situated on the east side of the Cape, and stretching out many leagues to sea). Over this bank, where it is always deep water, so strong is the current that ships have been drifted, under a main-top-sail, a-back, and against a heavy gale of wind, from eighty to a hundred miles in twenty-four hours. Many fatal shipwrecks have occurred there, from ships bound for the East Indies not having gone far enough to the southward; and they have, consequently, been set upon the eastern coast of Africa, where, from the nature of the coast, shipwreck is almost certain to ensue.

From the great strength of the current, it requires a strong breeze to stem it, and in gales of wind the seas are most tremendous.

In coming round the Cape of Good Hope, the current takes a north-westerly course, until it comes upon the north-east coast of South America; the strength of the

current falling upon that part called Cape St. Roque north of Pernambuco. Continuing its course past the mouths of the rivers Amazon and Orinoco, it passes the island of Trinidad, and thence, in a westerly direction, along the northern coast of South America. From the positions of the different islands hereabouts, the probability is that they originally formed part of the mainland, the softer strata of which having been worn away, the harder parts are left in the form of islands, as now existing.

The stream now continues its course through the Caribbean Sea, in a northerly direction, into the Gulf of Mexico ; thence it is turned, by the form of the land, in an easterly course, and flows out through the numerous passages at the Bahamas, with a velocity of from eighty to one hundred miles in twenty-four hours.

From the length of time that the water has been detained on the Mexican and Florida shores, it has acquired a high temperature ; so much, indeed, above the water of the Atlantic, that, in navigating those seas, the time of entering the Gulf Stream can be told within a few minutes, by the sudden increase of the warmth of the water.

This stream gradually increases in width, after leaving the Straits of Bahama, where it is about fifteen leagues broad. Continuing up the coast of North America, it is now, by meeting with the current from the Arctic Ocean, at the southern extremity of the bank of Newfoundland (where it is eighty leagues wide), turned to

the east, and, passing the Azores, or Western Isles, sets over upon the coast of Portugal; causing that never-ceasing swell which is found in the Bay of Biscay, on the coasts of France and Spain.

Its high temperature, as already stated, causes a great accumulation of vapour; this, in meeting the colder atmosphere at Newfoundland, is condensed, and forms those intensely thick fogs, so frequent in that latitude—in one of which the *Atalanta* was wrecked, as I will relate by-and-bye.

At the Azores, the width of the current is 160 leagues. It now tends, in a southerly direction, towards the coast of Africa, and, in a south and south-westerly direction, down that coast, till it again mixes with the equinoctial current, and performs the same course again. Thus the waters of the Atlantic are continually performing the same round. A branch of the current sets from the Azores, in a north-easterly direction, upon the British Isles and the coast of Norway. This is proved from the fact that ships make their passage from America to England in a shorter time than they do in going out; and, moreover, parts of vessels which have been wrecked in the West Indies, and plants from thence, have been picked up on the Hebrides and north-west coast of Scotland.

From these circumstances, the coast of North America, the Bay of Biscay, and the Cape of Good Hope are subjected more particularly to the heavy seas found in those places

There is no doubt that England is greatly indebted to this stream for the comparatively mild climate she possesses over other places similarly situated with regard to latitude ; from the circumstance of the water of the Gulf Stream being as much as 22° higher in temperature than the surrounding ocean, and gradually mixing with it, as shown by its increasing width, it raises the temperature of both water and atmosphere.

The depth of the Atlantic is extremely various, in many places being wholly beyond the power of man to fathom. Captain Scoresby, in the Greenland Sea, in 1817, plumbed (sounded) to the greatest known depth which a line has reached ; that is, 7,200 feet. Many parts of this ocean, however, must be much deeper.

I stated that I would relate the particulars of the wreck of the *Atalanta* ; I will, therefore, do so now.

You will observe, my young readers, in this instance, the effect of that truly essential property, so well maintained on board of a British man-of-war, called *discipline*. The following is from Captain Basil Hall's excellent work, called "Fragments of Voyages and Travels :"—

H.M.S. *Atalanta*, Captain Hickey, in November, 1813, was standing in (steering) for Halifax Harbour, in one of those thick fogs so prevalent on that coast, when they unfortunately mistook the signal guns of another ship in the same situation, for the guns at Sambo Rock, which are fired during thick weather, as a guide to ships entering the harbour. The consequence was, she struck on the rocks, which carried away her rudder, half the



THE "ATALANTA" ON THE ROCKS.



stern-post, a great portion of the false keel, and, it is believed, a portion of the bottom of the vessel. She instantly filled, and was buoyed up only by the empty water-casks, till the decks and sides were riven asunder by the waves. Captain H——, who continued throughout as cool as if nothing had occurred, now ordered the guns to be thrown overboard ; but, before this could be attempted, she fell over so much, that the men could not stand on the decks. In lowering the boats, the jolly-boat was lost.

The ship now fast fell over upon her beam ends, and the masts were cut away ; but the crash caused the ship



to part in two, and, a few seconds afterwards, she again broke right across between the fore and main-masts. In this position the wash of the sea sent the water entirely over her decks, sweeping off all that obstructed its passage.

A considerable number of the crew had got into the pinnace, in hopes that she might float as the ship sank.

Edward, where was the pinnace stationed ?

“ Upon the deck, with the booms, in the waist of the vessel.”

Right, my boy ; now I will go on again.



PINNACE.

Captain H——, seeing that the boat was overloaded, desired some twenty men to quit her, and his orders were as promptly obeyed as they were coolly given—so complete was the discipline.

The pinnace shortly floated, but was upset by a sea. The people in her, however, imitating the coolness of their commander, retained their self-possession, and, by great exertions, righted her ; and, at a little distance off, lay waiting for further orders from the captain, who, with forty more, still clung to the wreck. The other boats were got out and took off some of the men to the pinnace ; and, in order to enable it to contain them, the men, as removed to the pinnace, were laid down in the bottom of the boat as close as herrings in a cask ; while the small boats returned to take off the rest, which was with great difficulty at last accomplished, the captain being the last to leave the ship. Except the despatches and one chronometer, everything was lost.

The pinnace now contained eighty persons, the cutter forty-two, and the gig eighteen, with which they barely floated. Hardly had the captain got into the boat when the last fragments of the ship disappeared, accompanied with three cheers from the gallant crew. The fog con-

tinued as dense as ever, and they had no means of knowing which way to steer, and if it had not been for a small compass, which one man had appended to his watch as a toy, they might not have been preserved. At last they landed, about twenty miles from Halifax, nearly naked, wet, and shivering, and cramped by being crowded so many hours in the boats. The captain took the worst provided and most fatigued round to the harbour in the boats, and the rest, under the officers, marched across the country, in three divisions, with as much regularity as if going, well-appointed, upon some expedition. Though very few had shoes, and they had to traverse a country only partially cleared, that same evening the whole crew, without one missing officer, man, or boy, assembled in Halifax, in as exact order as if their ship had met with no accident.

Having shown you, my young readers, in the above, the value of good discipline in a man-of-war, I will now relate to you the account of the wreck of the *Medusa*, a French frigate, and the lamentable results arising from a want of discipline.

The French possessions on the west coast of Africa, extending from Cape Blanco to the mouth of the Gambia, having been restored to them at the general peace, in 1814, an expedition, consisting of a frigate and three smaller vessels, was sent, in June, 1816, to take re-possession of them.

This expedition was complete in all its parts, including men of science, artizans, agriculturists, gardeners, miners, &c., amounting, with the troops, to nearly 400 persons,

exclusive of the crews. The naval part was entrusted to Monsieur Chaumareys, who was in command of the frigate.

From want of discipline and common care in navigating, the frigate was run aground on the bank of Arguin. It being found impossible to get her off, nothing now remained but to concert measures for the escape of the passengers and crew. Some biscuit, wine, and water were accordingly got up, and prepared for putting into the boats and upon a raft hastily constructed. But, in the tumult of abandoning the wreck, the raft, which was destined to carry the greatest number, had the least share of provisions: though of wine there was more than enough, there was not a single barrel of biscuit.

This raft, on which were 150 persons, put off with the boats, five in number, containing the rest.

On leaving the wreck, the geographical engineer, who had volunteered to accompany his men on the raft, wishing to be assured that the proper instruments and charts for navigating it had been put on board, was told by the captain that all had been provided, and also a naval officer to take charge. This officer, however, jumped into one of the boats, and never joined them.

The boats pushed off, towing the raft; they had not, however, proceeded two leagues from the wreck, when, finding it retarded their progress, one by one they cast off the tow-lines, pretending they had broken, and, instead of staying by the raft, abandoned it to its fate.

By this time the raft had sunk above three feet, and

the people were so squeezed together that it was impossible to move. Finding themselves abandoned, their consternation became extreme. The officers, by putting on a show of confidence, succeeded in restoring the men to a certain degree of tranquillity, but were themselves overcome with alarm on finding that neither compass nor chart had been left with them.

None of the party had taken any food before they left the ship, and hunger oppressing them, they mixed all the biscuit (some 25 lbs.) with wine, and distributed it to each.

They succeeded in hoisting a sail, which had fortunately been left with them, upon a kind of mast which they erected. It was some time before they could persuade themselves that they were really deserted by the boats; but time passed on, and none returned.

Night now came on, and the wind freshening (increasing), the sea broke over them in all directions. In the morning a horrid scene presented itself; ten or twelve unhappy creatures had got jammed between the spars of which the raft was composed, and perished in that situation. Many anxious looks were cast round the horizon in the hope that some of the boats might be returning to them—but in vain; none appeared—they were alone on the waters. The next night the wind and sea again arose, and numbers were swept off, and at the centre of the raft several were smothered by the pressure of their comrades.

Firmly persuaded that they were all upon the point of being lost, both soldiers and sailors determined to relieve

their last moments by drinking. They bored a hole in the head of a cask, and continued to drink till the sea-water, mixing with the wine, rendered it no longer drinkable. Being now maddened with the wine, they boldly declared they would murder the officers, and then cut the ropes which bound the raft together. One of them, seizing an axe, actually began the dreadful work; but the officers rushed forward to quell the mutiny, and the man with the hatchet fell first. The passengers joined the officers. One fellow was detected cutting the ropes, and was immediately thrown overboard. A furious charge was made upon the mutineers, who now fell upon their knees, asking mercy; but after an hour of deceitful tranquillity another attempt was made. A general slaughter now took place, and the raft was strewed with dead bodies.

On the return of day it was found that sixty-five had perished. Only one cask of wine now remained, and at length the survivors were driven to that pitch of hunger as to be compelled to have recourse to eating the dead bodies of their comrades.

A third night of horror approached. In the morning the daylight showed them ten or twelve more who had perished, all of whom, except one, were thrown into the sea. At this period a shoal of flying-fish fell on the raft. They were secured, and, by means of a little gunpowder and linen, a fire was made in an empty cask, and they were dressed and eaten.

On the fourth night another mutiny was attempted, but was speedily quelled.

Only thirty persons now remained, many of whom had lost all the skin from their legs and thighs ; and, from wounds and bruises, were not able to support themselves. Two soldiers, at this time being discovered at the wine-cask, were immediately thrown into the sea.

Their number was now reduced to twenty-eight, fifteen only of whom appeared able to exist for a few days. For the safety of these it was determined to throw the others overboard, which was done ; and, however horrid the act, it was the means of saving the rest. After six days of suffering the brig *Argus* hove in sight and took off the remainder, six of whom died soon after they were landed.

Such is the history of these unfortunates, only nine of whom, out of 150, survived. Of those in the boats, however, only two or three perished.

So badly were affairs managed that a vessel which was sent to look after the wreck made three attempts before they succeeded in reaching her, and, to their astonishment, found, after fifty-two days' lapse of time, three poor creatures on it in the act of expiring, so that a few hours would have put an end to their misery and wretchedness.

About the same time, H.M.S. *Alceste*, commanded by Captain Maxwell, was wrecked, under similar circumstances, and at about the same distance from land, in the Straits of Caspar, to the west of the Philippine Islands. In this instance every person was saved and brought to England.



CHAPTER XII.

Arctic regions—Description of icebergs—The white bear—Greenlanders and their canoes—West India Islands—Sea-birds.

SAILORS, although they lead jolly lives ashore, and afloat too at times, are yet exposed to many dangers besides those I have named. Among these is one of

which landmen seldom think, but which has sent many a good ship to the bottom of the sea, with all her freight of valuable merchandise and still more valuable human lives. The list of missing ships, that is, those which have sailed away from their ports and never again been heard of, is considerably increased by the numbers lost in the ice.

The northern part of the Atlantic, in the arctic regions,* is much encumbered with ice; and immense floating islands of this frozen water, detached from the main body, and called icebergs, approach, in the months of June and July, so far south as to add much to the danger of a passage between North America and England.

“Have you ever seen icebergs, Grandpa?” asked Charles. “It must be a splendid sight, if they are like the pictures of them that I have seen.”

They are so; and when broken up by the summer sun, and drifted by the winds and currents into the more southern latitudes, they are truly magnificent, particularly when, rising in pinnacles to the height of eighty or a hundred feet, and upwards, the rays of the sun are reflected in brilliant colours on their glass-like surfaces. Where icebergs of a great height are floating, it is certain to be in very deep water, as there is always six times as

* The Arctic Ocean, or Northern Icy Sea, extends from 66° 30' north latitude to the North Pole, and has communication with the Pacific Ocean through Behring's Straits on the north-east of Asia, and with the Atlantic on the north-west of Europe.

much below the surface as there is above it. Thus if an iceberg be fifty feet high above water, the part immersed will be 300 feet, and its whole height 350 feet.

Captain Parry, in his voyage of discovery to the arctic regions, had frequent opportunities of ascertaining the above fact. He thus describes a large iceberg, of which he took the dimensions.

“One of the *Isabella's* boats, which happened to be a short distance before us, went into a little creek on one side of it, which appeared the only place where it was possible to get upon it, on the side we then were. On examining this place, however, they considered it too difficult for the attempt, so that, without any further examination, the boats pulled right round the berg. This was a labour of some hours, and, what was still more grievous, there was not a single place where we could possibly attempt to get up, the sides of the iceberg being as perpendicular as the walls of a house, and, at an average, between forty and fifty feet high. After performing a circuit round the enormous mass of ice, we returned again to the above-mentioned creek, where with some difficulty one of our men scrambled up. By means of a line which he made fast to the top we all got up, and that without much loss of time; for the man who first ascended, on looking round, observed a white bear at a little distance from him. We prepared ourselves immediately to attack this formidable animal, some with muskets, and the others with lances and boarding-pikes. He at first advanced towards us, but on perceiving that our approaches were



ON THE ICE.



mutual, took to his heels towards the opposite side of the berg. As we were, however, acquainted with its height, as well on that as on every other side, we made ourselves quite sure of securing him, and, in order to be more expeditious, divided ourselves into two parties, for the purpose of hemming him in ; but, very much to our disappointment, and contrary to our ex-



pectations, we found that he had leaped off the berg, at a place where we estimated its height to be about fifty feet. On looking over the precipice at this part, I observed several large fragments of ice floating on the bottom, on one of which he is supposed to have fallen, and to have been killed, as we did not see him afterwards. He was not very large, but we found the tracks of several large ones on the berg. The entrance by which we supposed they got on it was through a kind of vault or cavern, which led from the creek where we left the boats to a small valley into which the sea flowed. After our fruitless chase of the bear, we proceeded to measure the iceberg, the dimensions of which were as follows :—

“Length, 2 miles and 649 yards ; breadth, 2 miles and

26 yards ; thickness, allowing 51 feet to be the average height above the surface of the sea, as was found to be the height at the place where it was measured, 357 feet ; weight, about 1,292,397,673 tons.

“For the sake of amusement, it was calculated what space the quantity of ice in this iceberg would cover if reduced to the thickness of 6 inches, which, it was presumed, would be sufficiently strong for the purpose of skating. From the result of this calculation, it would appear to be sufficient to cover a space equal to about 3,505 square miles.”

The following is a description of the different forms in which ice is met with in these regions.

Those stupendous masses of ice fallen in with in Davis's Straits, and sometimes near Greenland, are called icebergs, or ice islands.

When a number of pieces of ice are collected together in close contact, in such a way that they cannot be seen over from the mast-head, this is termed a *pack*. When the collection can be seen across, if it assume a nearly circular form, the name of *patch* is applied ; and it is termed a *stream* when of an oblong form, however narrow it may be, provided the continuity of the pieces is preserved.

A *field* is a continued sheet of ice, so large that its boundaries cannot be seen over from the ship's mast-head.

Pieces of ice of very large dimensions, but smaller than fields, are called *floes*. Thus, a field may be compared to a pack, and a floe to a patch.

Small pieces which break off from the large masses are called *ice-brash*, and may be collected into streams and patches.

Ice is said to be *loose*, *open*, or *drift*, when the pieces are so separated as to allow a ship to pass through them, as shown in the accompanying sketch.



A *hummock* is a protuberance raised upon any plane of ice above the common level.

A *calf* is a portion of ice which has been depressed in the same manner as a hummock has been raised; namely, by pieces of ice mutually crushing each other.

A little account of the Greenlanders and their *kajaks*, or canoes, may not be uninteresting to my readers.

The people are rather below the ordinary stature, but appear well proportioned and stoutly built. Their dress is made chiefly of the skin of the seal—an animal very common in these regions—and consists of a sort of frock and small clothes, with the hairy side of the skin gene-

rally outermost. They wear boots of the same material as the rest of their clothes, but in this instance the hairy side of the skin is innermost.

Their canoes are made of seal-skins sewed tightly together on a wooden frame.



They are in general between sixteen and eighteen feet in length, but very narrow, their breadth seldom, if ever, exceeding two feet. They are pointed at both ends, so as to move either way.

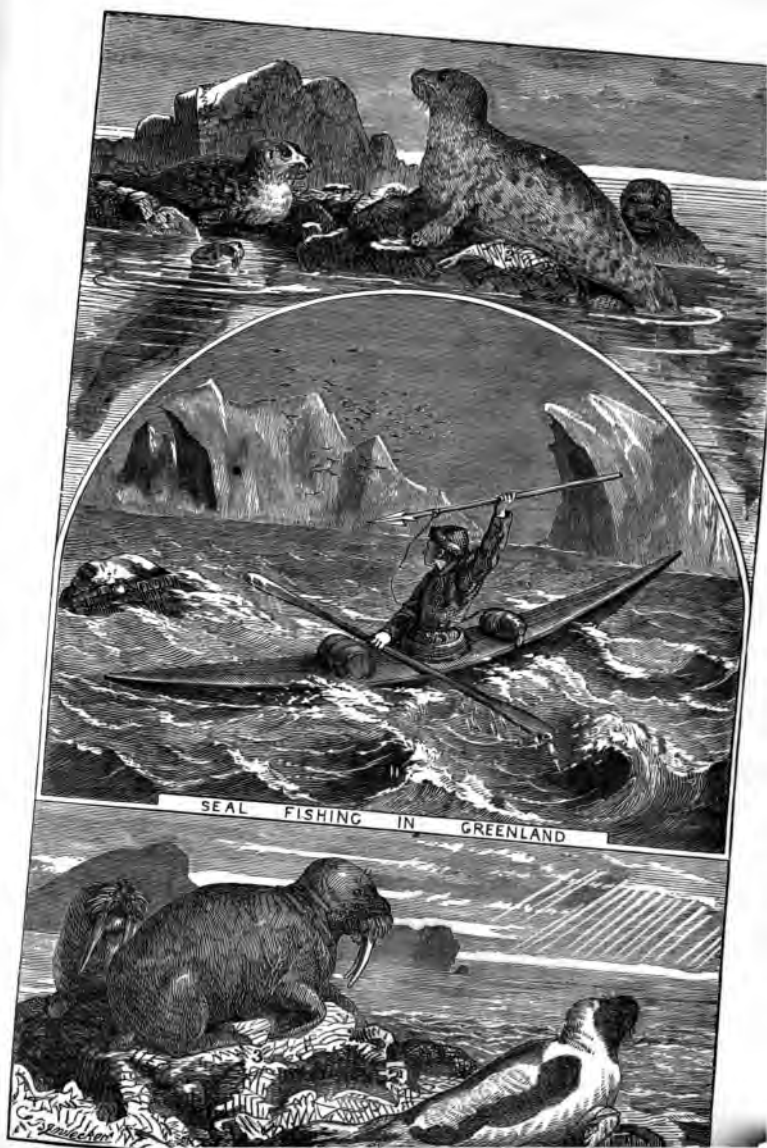
In the middle is a circular hole, in which the Greenlander sits, apparently with

as little fear of being upset as if he were seated in the finest barge. Around the rim of this hole is fastened the tail, or lower edge of his sealskin jacket, by which contrivance the canoe is made completely water-tight, even in the roughest sea. Here is a sketch of one of these canoes.



They row with one paddle, which is between five and six feet in length,

small in the middle, at which part they hold it, and broad at each extremity. By striking alternately on either side, they get through the water with a velocity equal to, if not exceeding, the swiftest row-boat.



Owing to their dexterity in managing their canoes, I believe the Greenlanders are perfectly safe, although a person unaccustomed to them would be in danger of upsetting. What we should be apt to consider as defects in these vessels, in other parts of the world, are in this country essential qualities. I allude here to their lightness particularly; for whenever they are in danger of being beset by the ice, the natives have only to get upon it, when they can easily carry their canoe on the shoulder, or even under the arm. Their being low in the water is another advantage, for they can approach seals and birds very closely without being perceived. All their fishing and fowling apparatus—namely, spears, harpoons, lines, and lances—are, with the exception of an inflated seal-skin, which is stationed behind, placed before them on a canoe. These, although simple, are well adapted to the respective purposes for which they are intended. The harpoon, which they employ for killing the seal, has the inflated seal-skin attached to it by



SEAL.

a long thong. This buoy answers a double purpose, as it points out, in the first place, the course the animals take, so that they can be more readily followed; and, secondly, tends to exhaust them, since whenever these animals are wounded they

instantly dive, and, by this constant struggle against the buoyant skin, in a short time fall a prey to their pursuers.

I have, however, my young readers, got a little out of my course for Port Royal, to have travelled thus far into the arctic regions ; and I must now make all sail back again to my ship, which I left ploughing her way across the Atlantic Ocean. But, as no event of consequence occurred during the passage, I trust I shall be pardoned this digression.

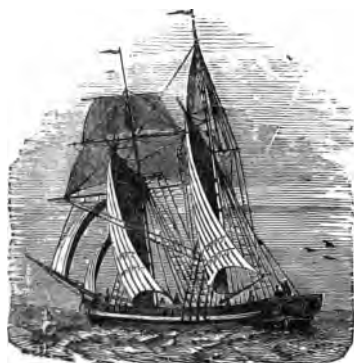
We at length joined the squadron at Port Royal, in Jamaica, one of the West India Islands.

In mentioning the West India Islands, it will not be necessary for me to state more than that they lie between 10° and 25° north latitude, and 60° and 85° west longitude. The largest of them are Cuba, St. Domingo, Jamaica, and Porto Rico ; besides which there are numerous small islands, and some little better than mere rocks. Those which are the most westerly are generally called the Windward Islands, and the other small islands to the eastward, which are Martinique, Barbadoes, Guadaloupe, &c., are called the Leeward Islands.

At Jamaica most of the crew, when not on duty, were allowed to go on shore to "stretch their legs," as they said, as if there was a possibility of their being cramped in a first-rate, with so much room to run about. However, my young readers, I can assure you it is a very pleasant thing to have a run on shore, after a voyage ; and I cannot express to you the delight I myself experienced on setting foot upon the dry and solid ground.

It is rather remarkable that the persons who are accustomed to sail between these islands have so much experience in the existing currents, that they are never at a loss to find out the direction of north, and do not, therefore, encumber themselves with either compass or quadrant; independently of which they can hardly sail twenty-four hours without making (seeing) one of the islands. Should such, however, not be the case, they have an infallible remedy; for each island has its peculiar sea-bird, and wherever these may wander in the day-time, they invariably seek their own island at sunset. The captain, therefore, never fails to know, from the direction in which he sees any particular bird fly, towards sunset, to what island it is going.

The vessels trading between these islands are generally small schooners, and formerly the mails were carried in them.





CHAPTER XIII.

Squadron starts to cruise on the east coast of North America—The *Undaunted* strikes on a sunken rock—Gets off again, and makes sail to rejoin the squadron—A fothered sail to stop the leak—Chain pumps at work—The water gains on her ; she is sinking—Her crew get off in the boats—The *Undaunted* founders—Description of press-gangs—Ned Stokes, the pressed boy, afterwards a post-captain—The tender.

SOME days elapsed, during which our brave seamen were allowed to enjoy themselves on shore at Port Royal ; and after this we were dispatched to cruise on the east coast of North America. In company with us were the *Undaunted* and *Termagant*, our old companions, and two or three other vessels, transports with troops on board.

For some time we kept cruising about, keeping a bright

look-out for the enemy, but none appeared in sight. Days and weeks wore on, during which we visited many of the islands; and the transports left their troops at the different stations according to the orders they had received. Each day we looked for something to rouse us, but in vain.

The Bahama, or Lucaya Islands, are in the Atlantic Ocean, near the east coast of North America. The group comprises about twenty islands, which are inhabited, and there are as many as 3,000 islets (or small islands and rocks), comprising together an area of 3,020 square miles, and a population of upwards of 35,000; but there were not so many people when I was there.* The principal islands are New Providence (containing the capital, Nassau), St. Salvador, Harbour Island, Great Bahama, Long Island, Eleuthera, and Berry Islands. They are in general fertile. The population consists of about two-thirds blacks, and the rest whites and people of colour. A great many of the inhabitants, from their occupation, are called wreckers.

These are constantly employed in the humane business of rescuing shipwrecked vessels, with their crews and cargoes, from the waves. They sail in small flat-bottomed sloops, just fitted for the seas which they navigate. They are excellent sailors, are familiar with all the keys (small islands), rocks, shoals, and breakers (sunken rocks, upon which the sea breaks with great violence), and with alacrity and courage encounter any danger or hardship.

* It must further be remembered, in regard to this and similar cases, that it is now some years since Grandpa spoke.

They are licensed by the governor, and receive salvage (a certain sum per cent.) on all property they rescue from the waves. By day they are always cruising; at night they usually put into the nearest harbour. Their great places of resort are the Florida Gulf, the Hole in the Wall, and the Hogsties, which are general places of rendezvous for all descriptions of vessels in these seas.

The number of these vessels is very great, forty sails being sometimes seen in one inlet.

The island of St. Salvador was the first land discovered by Columbus on his voyage in the year 1492. New Providence Island was occupied by settlers from England in 1629, and was held by them till 1641, when they were expelled by the Spaniards, who, however, made no attempt to settle there, and the English again colonized it in 1657; but it fell into the hands of the Spaniards again in 1703, after which it became the rendezvous for a horde of pirates, who were eventually extirpated, and the celebrated Black Beard, or John Teach, of whom most horrible accounts have been published, was the leader of the Buccaneers. He was killed off the coast of North Carolina in 1718. The islands were soon after abandoned by the pirates. The Bahamas are under the jurisdiction of the English.

Our little squadron kept well together, and no event of importance occurred for several days.

One afternoon, whilst passing between two of the Bahama Islands during a heavy gale, we observed the *Undaunted*, a little to windward of us (ahead), suddenly

stop, and her mast and sails shake with tremendous force. We instantly guessed what was the matter : she had struck upon a coral reef. As we were going right before the wind, we were soon abreast of her.

By this time, however, she had swung off again, and was making all the sail she could, with a fothered sail under her bows, with the intention of regaining her lost way. (A fothered sail is a square sail swung round the bow and under the bottom of the ship, and secured as tightly as possible, to endeavour to stop the leak.) We observed her chain pumps were at work, and whole cataracts of water gushing from them ; while clear white jets spouted from all the scuppers, fore and aft. (Scuppers are holes along a ship's side, level with the decks, to allow the water to run off from them.)

Shortly after the British ensign seized (set up or fixed) union down, in the main rigging, gave sign of the utmost distress.

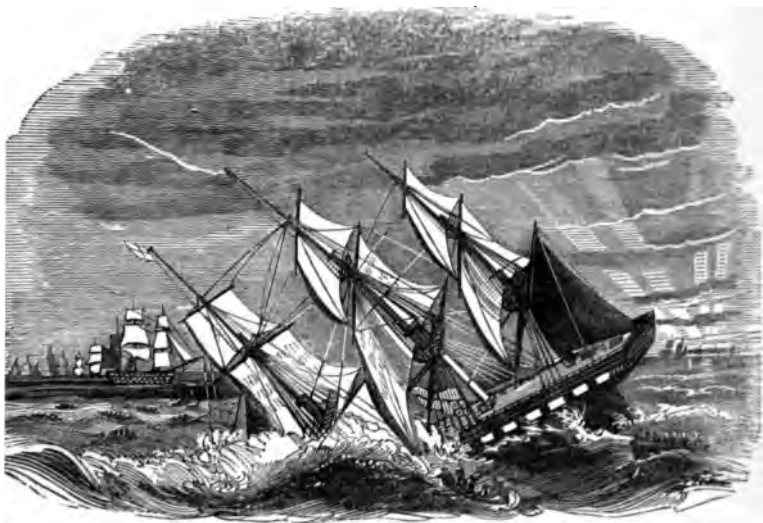
Still she kept afloat, and, though behind her companions, she yet moved onwards. The leak, however, must have been a very large one, for the water in her hold increased most rapidly, and she soon began to roll heavily, till at length the yard-arms dipped alternately in the water, and she reeled like a drunken man.

Suddenly a splash was heard. One of the forecattle-guns was hove overboard, and both broadsides, one after another, followed.

By this time the gale had given way to a light breeze, and though there was still a great deal of motion in the

water, the waves were gradually subsiding into ripples, and the boats from the other ships were enabled to come to her assistance.

The water still gained upon her, and it became evident that she could not long remain afloat. It was, therefore,



time for them to begin to save all they could from the sinking ship. Her boats were got out, and soon the boats of the other ships, who had all hove to, joined them. Now were to be seen handed over the unfortunate frigate's sides, hammocks, bags, officers' kits (clothes, &c.), and everything of value that could readily be got hold of. The men were told off (every man called by name amongst

the gang with whom his duty was performed), and passed as quietly over the side, by watches, as if at muster, all the officers last. She was now seen settling in the water. The captain had not quitted her, but remained uncovered at the gangway, with tears in his eyes. Few can imagine the poignant feelings that would agitate the breast of a commander at beholding the destruction of the ship with which he has been entrusted, and which, under his care, has braved the dangers of the deep, and nobly stood forward in the battle and conquered her enemies. All this must recur to his memory, and in such manner that he only who is in a like position can feel, but not describe.

The noble captain was the last man to leave the ship, and this he appeared to do reluctantly. At last he descended the side and stepped into the boat alongside, and but just in time; for it had scarcely got beyond the reach of the yard-arms of the ship when the latter made a heavy lurch forward, and her bows were immersed in the dark waves. She could not lift her head again. The next wave rolled on, and the hull of the ship was deeper down in the briny element. At length none of it was visible. As she went down with all sail standing her sinking was gradual, and though the hull was lost to sight, her topmast sails were filled by the wind; but it was only momentarily. The fore-topsail sunk fastest. At last all was gone but the white pennant on the maintop-gallant-mast-head. It fluttered for an instant in the breeze, and the last remnant of the ill-fated frigate had vanished for ever.

"What a shocking catastrophe! But were the crew all saved, Grandpa?" asked Edward.

They were, and were distributed among the other ships. It was rather fortunate for us, for we were short-handed—that is, we had not our full complement on board—and we were thus enabled to make up our number.

We had sailed from England rather short of hands, for my uncle did not like pressing men, and, without resorting to that method, there was in those days great difficulty in getting a ship's crew together.

You may have heard, my young readers, of press-gangs, but you may not know what they really were. I will tell you. A press-gang was a body of seamen, twelve or fourteen in number, commanded by a lieutenant or mate,* all armed with bludgeons, cutlasses, and pistols, who visited the different resorts of seamen in seaport towns; and those who were not *willing* to join the naval service were carried off by *force*, and sent to any ship that was in need of men. These were thence called pressed men.

In war-time seamen who did not wish to join a king's ship were often obliged to hide themselves to avoid being seized by these gangs. When they went to a public house—which sailors are generally obliged to do in strange towns to procure lodgings—they met in bodies of ten or twelve, so as to be equal in strength to the press-gangs, that some of their number might chance to escape if the gang should surprise them. This very fre-

* The term *mate* is now almost obsolete; now sub-lieutenant.



quently happened, and serious fights between them ensued, in which many on both sides were wounded. Those

who were seized were sent off to a small vessel, called the "tender," lying in the harbour, where they were closely confined below in the hold until drafted into a ship going to sea. Many poor fellows who were not sailors have been seized by the press-gangs because they appeared strong healthy men and likely to be of service on board, some of them with wives and families at home hourly expecting their return. And it sometimes happened that the poor fellows remained at sea many months before their families, who were left in the greatest distress, at times wanting the means of subsistence, could learn what had become of them. These cases did not very often occur, but it is a sad reflection that the services of the country ever required such cruel means to be adopted to man our ships as that of depriving a poor family of its only support and protection. But press-gangs were only used in cases of great emergency in war-time, and it is to be hoped that their services may never again be required. It is a very hard task for the sailors who form these gangs to be compelled to force men from their homes and families without a moment's notice, and I have known many, much to their credit, refuse to join one.

I well remember the case of a poor boy who was seized by a press-gang whilst begging at the gate of a gentleman's house, and, as it happened happily for him, I will relate it.

After his seizure, he was sent on board the tender.

Tenders are vessels of different sizes, usually cutter rigged, used to attend on the admirals both at sea and at the different stations ; and in foreign ports for conveying

orders, drafts of men, &c., from one ship to another, as occasion may require : they are generally armed vessels.

The poor pressed boy was placed in the hold, which was crowded with men and lads, who had either been pressed, or were sent away by the civil power for misdemeanours. Some were sober and sorrowful, others were intoxicated and noisy, and incessantly trying to annoy the



MAN-OF-WAR TENDER.

rest. It was a scene of dreadful confusion, and the stench and heat were scarcely endurable. Every now and then a quarrel took place, and severe blows were exchanged, so that there were bruised features, and even fractured limbs ; but no one in authority interfered or took the slightest notice of their proceedings ; they were left entirely to themselves, and, as the number of intoxicated kept increasing, they rolled over or trod upon the un-

happy creatures who did not, or could not, give way to the indulgence of drunkenness. Not unfrequently a lurch or roll of the vessel would throw some, who could not preserve their balance, with violence against the sides of the ship, and bruises and wounds were the consequence.

Such a spectacle as this could not give the poor lad, who was called Ned Stokes, a very favourable opinion of the life of a sailor ; and though he had once earnestly wished to become one, and had in consequence rather willingly followed the press-gang, yet, in truth, he was now heartily disgusted, and as earnestly wished himself ashore. But if the occurrences of the day (although only a dim twilight in the hold) could thus affect him, how much more were his sufferings increased when night came on, and all was utter darkness—whilst the same debauchery, noise, and fighting continued, and the grating being placed over the hatchway, scarcely a breath of air could be felt by those below. The following morning the tender arrived at her destination, and ran alongside the guard-ship at Spithead (a safe anchorage for ships of war, between the Isle of Wight and Portsmouth Harbour). Delighted was the poor boy to escape from the miserable place in which he had spent a day and night ; and cool and refreshing was the breeze that fanned his parched and fevered cheeks, when, with the whole of his late companions, he ascended to the deck of the guard-ship, where they were ranged for inspection, and, one by one, summoned into the office to give their several names and occupations. At length Ned's turn came ; and, having

given his name, the clerk, noticing the haggard and distressed countenance of the lad, demanded, "And where have you done duty, Ned?"

"What, sir?" asked Ned, who did not exactly comprehend the question; "did you ask me where I had done my duty?"

"Yes," responded the clerk in a tone of banter, as he mimicked the lad's manner, "that's what I asked you."

"Well, then, I've done it at Camberwell, in London," answered Ned, alluding to his former course of life; "but I hope you are not going to keep me here."

"Oh, no," replied the clerk with mock respect, and trying to puzzle the lad, "your services are too valuable to be confined to a guard-o (guard-ship); in fact, I shouldn't be surprised if they made you an admiral at once."

"What!" uttered the astonished Ned, as the vision of a cocked hat and sword rose before him: "well, then, I'll do my duty anywhere and everywhere."

This reply was greeted with a roar of laughter from the clerk and his assistants; and poor Ned having declared that he had never yet been to sea, was entered accordingly in the muster-books, and ordered to go below. It was a hard trial for the poor fellow; he knew nobody, and no one either knew or cared for him; but still his admiration was excited by all he beheld and witnessed; and he found ample food for contemplation.

The next day he was drafted, with several others, into a seventy-four, that sailed in a few hours afterwards; and

if his admiration had been raised by a ship at anchor, how greatly was it increased when, with the canvas spread, the beautiful craft glided rapidly down Channel, and every evolution was performed with the precision of clock-work !

The line-of-battle ship was new, and destined for the Mediterranean, and in a short time Ned was upon the open sea. He had reconciled his mind to circumstances ; he was now a sailor, and his readiness to learn induced the captain to take notice of him. He was placed on the quarter-deck, as midshipman. His good conduct and bravery, after having served the proper time (six years), got him his commission as lieutenant. He afterwards became a post-captain, and is now one of my oldest and most esteemed friends. Such may be the reward of a strict attention to our duty, in whatever course of life Providence may place us.

You see, my young friends, that if Ned Stokes (I should now call him Captain Stokes) had followed the sinful and pernicious propensity of drinking with his former associates, he would have been an idle and a careless man, would never have obtained the notice of his captain or any of the officers, and, in all probability, never have risen above the rank of a common sailor.

Another case of impressment, which I well remember, occurred shortly after I had commenced my career as a sailor. It happened on board a ship of war lying at Plymouth, under sailing orders for a foreign station, and waiting only for a full complement of hands. It was also

at a time when men were so scarce that the jails were resorted to, and some of the ablest felons were selected to make up the crews.

The poor fellow, of whom I am about to tell you, came on board of us, with a draft of seamen, from the flag-ship, and a number of these convicts.

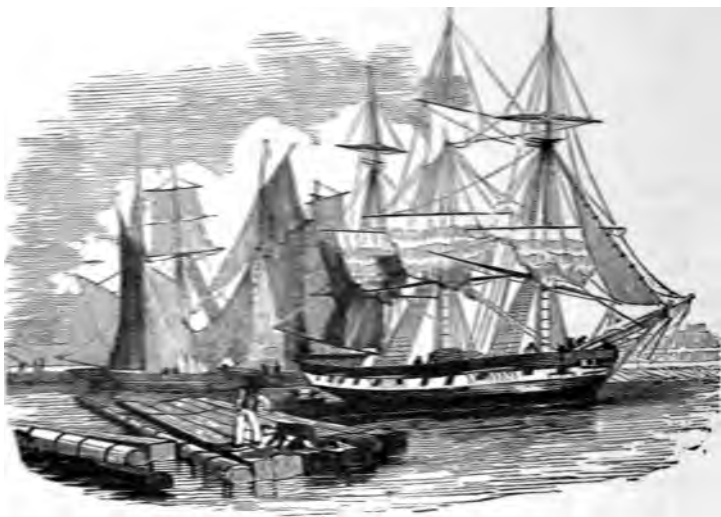
He had been a sailor from his boyhood ; and, shortly before he joined us, he served on board a merchant vessel as mate. His mother had been in very indigent circumstances ; in fact, her poor sailor boy was almost her only support.

By strict attention to his duty, and care of all he gained, the son had at length rendered his mother's home comfortable, and had just arrived in England from a voyage, full of joyous anticipation, when he received the melancholy intelligence that his mother was at the point of death. He hastened home, and reached it only in time to receive her farewell benediction. Thus was the cup of joy dashed from his lips.

Before the earth had closed over the remains of his parent, the press-gangs were actively on the alert, and the poor fellow fell into their hands. He was not even allowed to lay his poor mother in the silent grave ; he kissed the clay-cold bosom on which he had hung in infancy, and, with stern serenity, yielded himself a prisoner. He loved his country, and would not have shrunk from its service in the hour of battle ; but to be forced away at such a moment was draining the cup of misery to the very dregs.

He was a good seaman, but he, unfortunately, fell into the hands of a cruel and even brutal captain, who treated his silent grief with insult. (This captain was afterwards dismissed the navy for cruelty.) The poor fellow was treated with every indignity, and compelled to perform most of the menial offices of his station. It was a truly happy change for him when his services in this ship ended, and he entered another where his sufferings met with commiseration, and his meritorious conduct and ability as a seaman were duly rewarded by a kind and gentlemanly captain. I have not since fallen in with him ; but I have no doubt, from what I saw of him, that his general good conduct gained him friends, and that he has probably, since the close of the war, again entered the merchant service, in which it is very possible he may have the command of a ship.





CHAPTER XIV.

Havanna, in Cuba—Description of the island—Difficulties of navigation—Capture of the island by the English—Florida—Grandpa joins a store-ship with powder on board—The ship is on fire—Hoisting out the boats—Providential preservation—The bulkheads—Furling sails—Wearing round—The explosion—Admirals' rank—Loss of the *Queen Charlotte* by fire—Nelson as a schoolboy.

AFTER the loss of the *Undaunted* we made all sail for Havanna, in Cuba. This is the largest of the West India Islands, situated at the entrance of the Gulf of Mexico. This island was discovered by Columbus in the year 1492, and is now the most important of the colonies of Spain,

though how long it will remain so is a problem difficult to solve. The inhabitants have for some years made strenuous efforts to free themselves from Spanish rule. Cuba is about 750 miles in length, with an average breadth of from 50 to 60 miles, and has an area of 48,489 square miles.

Along the coast of Cuba are many quays and small islands, which are included in the same government with the large island. The navigation of the coast is very unsafe, on account of the rocks and shoals which encompass it in almost every direction, and often extend from two to three miles into the sea. The broken outline of this vast extent of coast, however, affords more than fifty ports and anchoring-places, which are equally safe and easy of access.

The soil of Cuba is so productive that it yields two, and even three, crops of corn in a year. The fields during the whole year are covered with aromatic plants and trees in blossom. The climate is dry and warm. It is, however, in common with all the West India Islands, subject to terrific storms of thunder, lightning, and wind, accompanied with tremendous showers of rain and hail. Whole hamlets and villages



have sometimes been swept away during these hurricanes, and an immense amount of life and property destroyed.

They are also frequently visited by earthquakes and violent shocks, in which very great damage is done.

Only a short time since, Guadaloupe, Antigua, St. Domingo, Martinique, and others of the West India Islands were visited by this dreadful calamity, and whole towns and villages entirely destroyed. It was upon Guadaloupe, however, that the full severity of the infliction fell. Accounts detail the entire destruction of the town of Point-à-Pitre, and other places, and of the loss of 2,000 lives. What was spared by the earthquake perished by the fire, which burst out a few minutes after the houses fell. A vast amount of property, in the country parts of the islands, was also destroyed; whilst the mills, the curing and boiling-houses for making the sugar, were all demolished. Indeed, it appears impossible to estimate the actual amount of loss sustained during this awful visitation. The number of deaths was estimated at 4,000, while the shocks were felt over 3,000 miles.

The coasts of the island of Cuba are well known to be unhealthy; but this is not the case with the high lands. It never freezes here, not even on the highest mountains. Among the insects, of which there are very many, are the mosquitos. These are extremely troublesome neighbours, as all who have had anything to do with them have experienced. Another, so small as to be almost invisible, called the greger, is also very troublesome.

The true riches of the country consist in its great

articles of export—sugar, coffee, tobacco, wax, cocoa, molasses, rum, maize, &c.

The population of Cuba, in 1871, amounted to 1,400,000 souls, of which 765,000 were whites, the rest being free mulattos and negroes.

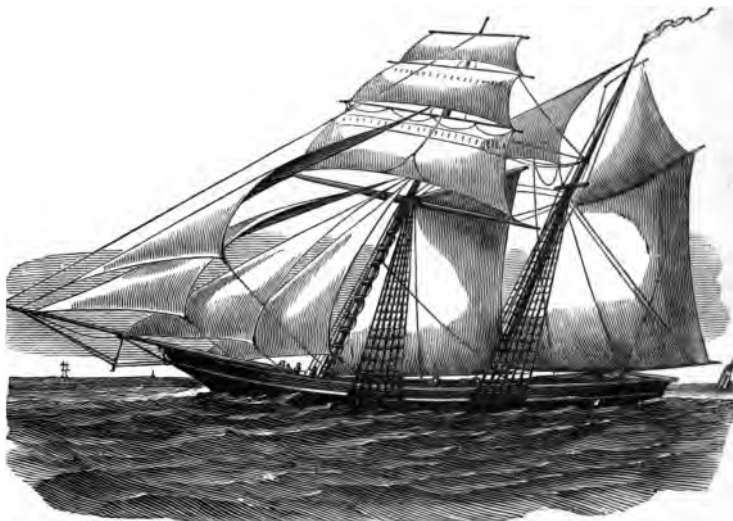
In 1762 a formidable expedition was sent from England to take possession of Cuba ; which, after its junction with the naval force that had been already serving in the West Indies, consisted of 19 ships of the line, 18 small vessels of war, and 150 transports, which conveyed 12,000 troops. The whole of the fleet appeared off Havanna June 6th. 4,000 more troops went from North America, in July, to reinforce them. The Spaniards, in whose possession it had been for more than two centuries, used every effort to defend the city, but in vain ; for, though the English were several times repelled, the Spaniards at last surrendered, August 13th. The booty obtained by the English was great ; about 3,000,000 of dollars, in specie, and a large quantity of goods, fell into their hands, besides a great quantity of munitions of war, nine ships of the line, and four frigates. In 1763 the conquerors, notwithstanding the high opinion they had of the importance of Cuba, restored it to Spain, in exchange for the Floridas.

Florida is a country in the United States of North America, and forms part of the eastern boundary of the Gulf of Mexico. It is about 400 miles long, and 140 miles wide, and contains about 50,000 square miles. The principal towns are Tallahassee, the seat of Government ; Pensacola, St. Augustine, New Smyrna, and St. Mark's.

Florida, like Cuba, abounds in vegetable productions of most luxuriant growth. It is also remarkable for the majestic appearance of its towering forest trees, and the brilliant colours of its flowering shrubs. The pines, palms, cedars, and chestnuts grow to an extraordinary size and height. Some of the laurels are uncommonly striking objects, rising, with erect trunks, to the height of 100 feet; forming, towards the head, a perfect cone, and having their dark-green foliage silvered over with milk-white flowers, frequently 8 or 9 inches in diameter. There are eight different kinds of oak, among which is the live oak, which, after forming a trunk from 10 to 20 feet high, and from 12 to 18 feet in circumference, spreads out its branches, in some instances, 50 paces on every side. The cypress, generally growing in watery places, has large roots, like buttresses, rising around its lower extremity; then, rearing a stem 80 or 90 feet, it throws out a flat horizontal top, like an umbrella; so that, often growing in forests, all of an equal height, they present the appearance of a green canopy, supported on columns in the air. Many rich fruits, particularly limes, prunes, peaches, grapes, and figs, grow wild in the forests. St. John's River, and many of the lakes, are bordered with orange groves, and olives are cultivated with success.

Some of the most important productions of the country are sugar, coffee, cotton, rice, indigo, tobacco, vines, olives, oranges, and many other tropical fruits. The waters contain various kinds of excellent fish, and also abound

in alligators and other reptiles. In the summer months it is scorching hot at midday, and in the depth of winter it very seldom freezes. From the end of September to the end of June there is not a finer climate in the world.



FROM SCOTT'S.

But it is time, my young readers, that I now return to my story.

About this time we had added to our squadron a fast-sailing store-ship, having on board a quantity of small arms, and 800 barrels of gunpowder, together with supplies for the troops.

One of our senior midshipmen was appointed to this vessel, to take charge. I was allowed to go with him as


his first assistant (or first lieutenant, if you like). I was a great man in my own estimation, then, I can assure you, though only seventeen years of age. A circumstance, however, occurred here which made an indelible impression on my memory.

We had not left the body of the squadron many days when the ship took fire, in consequence of some lighted tobacco having fallen amongst the spare sails that had been indiscriminately stowed around the main magazine, built in the midship of the vessel, for the purpose of security.

The first symptom of the calamity that had befallen us was observed at two o'clock in the morning, when a dense smoke was seen to arise from the main hatchway ; and, as every one was aware that the powder was stowed away in that part of the ship, it is impossible to describe the consternation of the crew.

My companion and superior officer knew it required the exertion of every one in the ship to extinguish the smothered fire ; and we also knew that we were many leagues from the nearest land : we had lost sight of the squadron, as I have said, some days before. It was now that the energy of the officer was required ; and, after a moment's consideration, he decided upon hoisting out all the boats and towing them astern of the ship.

This having been accomplished, he had them all cut adrift, and addressing himself to the ship's company, pointed out to them that nothing could save their lives but the most decided exertions to extinguish the fire ; since it would be almost as well for them to be blown up



as to attempt their escape in the boats during this season of the year, when hurricanes and violent tempests were of so frequent occurrence, that it was scarcely possible they could gain any point of the nearest land without encountering one of them, in which they must all perish. There was also a danger of their falling into the hands of pirates, when they all knew what would most probably be their fate.

On hearing this and witnessing his example, all hands set to work in good earnest; and by dint of the wash-deck-pump and the few fire-buckets we had on board, we were enabled to prevent the smoke from ever becoming flame, and at the expiration of the next day we had the satisfaction of having extinguished every appearance of fire. (In the present day all large ships, and also many small ones, carry to sea one or two fire-engines, and a number of fire-buckets for service in cases of fire.)

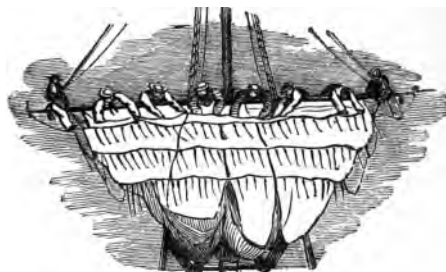
We now cleared away everything from around the main magazine; and, on closely examining it, discovered that the bulkhead, which separated the powder barrels from the main hold, was so nearly calcined (burnt), that the carpenter pushed his finger through it without much exertion. You may imagine the feelings of the men when they discovered what a narrow escape they had met with; and, on returning thanks to our Creator for this miraculous preservation, which we did publicly on the quarter-deck, our prayers came from the bottom of our hearts.

Having furled all the sails on the main-mast when the fire was first discovered, got down all the rigging we could

spare, and contented ourselves with wearing round occasionally, we were nearly in the same place as when the fire commenced, and had never lost sight of our boats, which were easily recovered.

“What is furling the sails, Grandpa?” asked Charles.

“Furling a sail is the act of gathering it up into a small compass along the front of the yard, which is done by passing a plaited rope (called a gasket) round the sail and the yard at certain distances, and fastening it. The annexed sketch shows the method of reefing a topsail;



in which case only a portion of the sail is drawn up to the yard, and secured by the reef-points (short pieces of rope fixed on each side of the sail). The men at each extremity of the yard are hauling upon the earings, which are fixed at each end of the reef-band, to draw up that part of the sail which is to be reefed. The men on the yard, who are standing or resting upon the foot-ropes, are gathering together the intermediate parts of the sail, until the row of reef-points is brought to the yard; the points are then passed over the yard and tied to those

behind it. The operation of furling includes the whole of the sail, and its appearance, when furled, is represented in the drawing of the frigate off the Owers.

We very luckily fell in with the squadron a few days afterwards, and were relieved from the charge and responsibility of keeping so much powder on board.

"What is a bulkhead, Grandpa?" asked Charles. "I don't think you have told us what that is. And what is the meaning of wearing round?"

"Right, my boy; I don't think I have, but I should have done so," replied Grandpa.

A bulkhead is a partition or separation between the decks:—thus the partition at the captain's cabin, which separates it from the quarter-deck, is a bulkhead; the partition in front of the admiral's cabin, separating it from the half-deck, is also a bulkhead; and in every other part of the ship, where wood frameworks or partitions are run up between the decks, they are called bulkheads. When a ship meets with an enemy, the order that is first given is to "clear the decks for action." All these bulkheads are then either removed, or slung up under the beams of the decks out of the way; for, if left standing, a shot might strike and knock them in pieces, and drive the splinters about in all directions, causing more mischief than the shot itself.

Wearing round, or the act of veering, is performed in this manner:—

The spanker is brailed up, and all the after sails are clued up (which is sometimes called "taken off"); the

helm is put a-weather, or to that side on which the wind is blowing ; and as the ship's head pays off (turns round) until the wind is directly aft, the yards are gradually braced round so as to be square (right across the deck). The ship, by the action of the helm, will still continue to go round, and the yards must now be braced round also, so as to allow the sails to receive the force of the wind upon the opposite tack, when the ship is said to be about, or wore round.

"Have you ever," asked Edward, "seen any other ship on fire, Grandpa?"

I have, replied Grandpa, in my career, both in action and on the open sea, witnessed this misfortune, the worse that can happen to a ship ; as there is no possibility of escape from it, except by the boats, which may not hold half the number of those on board ; and besides, it is likely they may be so far from land that it would be almost a miracle if they ever reached it.

I once saw a French ship which took fire while engaged with a British frigate. After burning several hours, she at length blew up. The explosion took place by night. This is a very grand though a truly awful sight. In the tremendous burst of flame that rushes up into the dark blue sky, immense pieces of timber, spars, &c., are hurled to a great height in the air, and all rendered distinctly visible by the intense illumination of the fire. At the same instant a stunning and deafening report breaks through the stillness of night, after which all is silent as before. The ship continues to burn until

all is consumed above the water's edge, when the waves rush in, and, amidst dense columns of smoke and vapour, the remnant of the hull sinks to the bottom, and all is gone for ever.

I will relate to you the destruction of the *Queen Charlotte*, a line-of-battle ship of 100 guns, which took fire off the harbour of Leghorn, on the 17th of March, 1800.

The *Queen Charlotte* was commanded by Captain Todd, and was, perhaps, one of the finest ships in the British navy. She was launched in 1799. In the early part of the year 1800 she was sent into the Mediterranean, and was the flag-ship of Lord Keith, the commander-in-chief on that station.

Admirals in command of a squadron hoist a flag according to their rank in one of the ships, which is then called the flag-ship. The rank of an admiral is known by the colour and place of his flag on the masts. The rear-admiral, which is the next step in promotion above a post-captain, hoists his flag at the mizen-masthead. There are three steps, or grades, of rear-admirals. The rear-admiral of the blue is the first step; the rear-admiral of the white the second; and the rear-admiral of the red the third.



The next three steps are, the vice-admiral of the blue; the vice-admiral of the white; and the vice-admiral of the red. Vice-admirals carry their flags at the fore-mast head.

The three following steps are, the admiral of the blue, the admiral of the white, and the admiral of the red. Admirals hoist their respective flags at the main-mast head. This last is the highest rank that can be attained in the service, except it be that of lord high admiral; which rank is seldom held by any but one of the Royal Family. The duties of this office are vested in a board of commissioners, called the Lords Commissioners of the Admiralty, who have to exhibit before Parliament the state and requirements of the navy, before any sums of money can be granted for its support. The Lords of the Admiralty have the management of all the dockyards, naval hospitals, and victualling departments; in fact everything respecting the navy, including almost all the appointments of officers to different ships and stations, rests with them. In March, 1800, the *Queen Charlotte* was dispatched by the commander-in-chief to reconnoitre the island of Cabrera, about thirty leagues from Leghorn, then in the possession of the French, which it was his lordship's intention to attack.

On the morning of the 17th the ship was discovered to be on fire, at the distance of three or four leagues from Leghorn.

Every assistance was promptly forwarded from the shore; but a number of boats, it appears, were deterred

from approaching the wreck in consequence of the firing of her guns, which were shotted, and which, when heated by the fire, discharged their contents in every direction.

The only consolation that presents itself under the pressure of so calamitous a disaster is, that it was not the effect either of treachery or wilful neglect, as will appear by the following official statement of the carpenter :—

"Mr. John Braid, carpenter of the *Queen Charlotte*, reports, that at about twenty minutes after six o'clock in the morning, as he was dressing himself, he heard throughout the ship a general cry of 'fire!' on which he immediately ran up the after-ladder to get upon deck, and found the whole half-deck, the front bulkhead of the admiral's cabin, the main-mast's coat, and the boat's covering on the boons, all in flames; which, from every report and probability, he apprehends was occasioned by some hay, which was lying under the half-deck, having been set on fire by a match in a tub, which was usually kept there for signal guns.

"The main-sail at this time was set, and almost entirely caught fire; the people not being able to come to the clue garnets on account of the flames.

[The clue garnets are ropes for hauling up the clues, or lower corners of the main and foresails, to their yards.]

"The carpenter immediately went to the forecabin, and found Lieutenant Dundas and the boatswain encouraging the people to get water to extinguish the fire. He applied to Mr. Dundas, seeing no other officer in the fore part of the ship (and being unable to see any one on the quarter

deck, from the flames and smoke between them), to give him assistance to drown the lower-decks, and secure the hatches to prevent the fire falling down.

“Lieutenant Dundas accordingly went down himself, with as many people as he could prevail upon to follow him ; and the lower-deck ports were opened, the scuppers plugged, the main and fore hatches secured, the cocks turned, and water drawn in at the ports, and the pumps kept going by the people who came down, as long as they could stand at them.

“He thinks that by these exertions the lower-deck was kept from fire, and the magazines preserved for a long time free from danger ; nor did Lieutenant Dundas or he quit this station, but remained there with all the people who could be prevailed upon to stay, till several of the middle-deck guns came through that deck.

“About nine o'clock Lieutenant Dundas, finding it impossible to remain any longer below, went out at the foremost lower-deck port, and got upon the forecastle ; upon which he apprehends there were then about one hundred and fifty of the people drawing water, and throwing it as far aft as possible upon the fire.

“He continued about an hour on the forecastle ; and finding all efforts to extinguish the flames unavailing, he jumped from the jib-boom and swam to an American boat approaching the ship, by which he was picked up and put into a boat then in the charge of Lieutenant Stewart, who had come off to the assistance of the ship.

(Signed) “JOHN BRAID.”

Captain Todd remained upon deck with his first lieutenant to the last moment, giving orders for saving the crew, without thinking of his own safety.

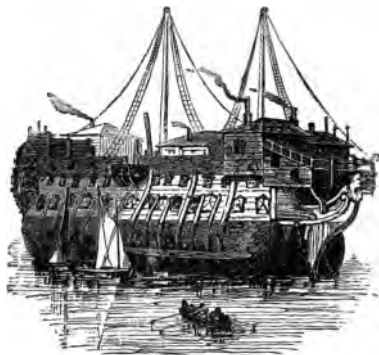
Before he fell a sacrifice to the flames he had time and courage to write down the particulars of this melancholy event, for the information of Lord Keith ; of which he gave copies to different sailors, entreating them that whoever should escape might deliver it to the admiral.

Thus fell victims to perhaps too severe a duty, the captain and his first lieutenant, at a time when they still had it in their power to save themselves ; but self-preservation is never a matter of consideration in the exalted mind of a British naval officer, when the safety of his crew is at stake.

Lord Keith and some of the officers were providentially on shore at Leghorn when the dreadful accident occurred. Twenty commissioned and warrant officers, two servants, and one hundred and forty-two seamen, were all of the crew that escaped destruction out of nearly nine hundred souls on board ; that for nearly four hours exerted every nerve to avoid the dreadful end which too surely awaited them.

Courage and intrepidity are absolute requisites in the person of him who commands a number of men. Perhaps few possessed this quality to a greater extent than that great naval hero, Lord Nelson, who, even in his earliest years, gave proof of that daring spirit and noble soul for which in after life he was so eminently distinguished. The following is an instance :—

Once, after the Christmas holidays, when he and his brother William had set off on their ponies to return to school, they found their journey impracticable, in consequence of a heavy fall of snow. They returned home and informed their father of the circumstance. "If that be the case," said Mr. Nelson, "you certainly shall not go ; but make one more attempt, and I will leave it to your honour. If the road is dangerous, you may return ; but remember, boys, I leave it to your honour !" William, who did not relish a journey under such circumstances, wished to turn back, but Horatio peremptorily refused. "We must go on, brother ; remember," said he, "it was left to our honour !"





CHAPTER XV.

Grandpa returns to the *Prince of Wales*—The *Juno* joins the squadron, and is sent to cruise among the West India Islands—Grandpa joins her—A sail upon the weather-bow—Orders to chase—Two other sail discovered with a fleet of merchant-ships under convoy—The disappointment—The *Juno* bears up in chase of the enemy—Breakers ahead, and land upon the lee-bow—Method of heaving the lead—The life-boat.

THERE was not a man on board the store-ship but was glad to meet the squadron again, all hands worked with great alacrity to get the powder up from the magazine, and we all rejoiced when it was delivered to the different ships. I also was glad, for I was very desirous of returning to my own ship, the *Prince of Wales*, where I was gladly received by my kind uncle and my mess-mates after my escape in the store-ship.

The West India station, however, was getting very

dull, nor could we get sight of the enemy we expected to find there. Wherever we touched at, he had been there a fortnight or three weeks before us, and off we went again in the endeavour to meet with him somewhere. Another large frigate, the *Juno*, joined us in the place of the *Undaunted*, and I was sent on board of her by my uncle's wish, as he said I should gain more knowledge of navigation and the method of managing a ship, by mixing with different captains and officers, than I should obtain whilst remaining only with him; and as the time of his cruise had all but expired on this station, I might in the *Juno* visit the different places he wished me to see, and return to him when he sailed for the Mediterranean, where he would have to join Lord Hood in about three months' time.

I gladly acceded to this arrangement, and soon got all my traps on board the frigate. We left the squadron, and for several days kept cruising about amongst the islands, but without meeting with any prize.

To amuse ourselves we got up a bit of a scheme, that should be for the benefit of one of the mess. It was this: each mid was to put a dollar into a bag, and then name a day on which he thought we should see a sail; but no two persons were to give the same day, and whoever guessed right was to have the bag.

This bag was getting rather heavy at last, for every one had lost two or three times, and no one had won. And we were now tired of our situation, and glad the cruise was almost ended; for we found the navigation very

dangerous, owing to unaccountable currents, so we shaped our course for Cape Antonio (the western point of the island of Cuba).

The next day the man at the mast-head, at about two o'clock in the afternoon, called out, "A sail upon the weather-bow."

"Ha! ha! Mr. Jonathan," said our first lieutenant, "I think we have you at last. Turn the hands up; make sail! all hands give chase."

There was scarcely any occasion for this order, for the sound of a sail being in sight flew like wildfire through the ship, and every sail was set in an instant, almost before the order was given.

Up went a lieutenant to the mast-head with a spy-glass, and "What is she?" was asked by the skipper (captain).

"A large ship standing athwart right before the wind," answered the lieutenant.

"Port!—keep her away!—set the studding-sails," shouted the captain; fearing that the enemy was too large to cope with, and that he might have to run for it.

Again was called from the mast-head, "Two more sail on the port beam!" and instantly after, "I see a whole fleet of twenty sail coming right before the wind, sir."

We were quite confounded at such luck.

"This is some convoy or other," said the captain; "but we must try and pick some of them out. Haul down the studding-sails; luff (bring her to the wind); let us see what we can make of them."

About five o'clock we got pretty near: they proved to be twenty-two sail of American merchantmen, under convoy of three line-of-battle ships, one of which chased us; but when she found we were playing with her (for the *Juno* sailed a great deal faster than our would-be captor), she gave up the chase and joined the convoy; which the men-of-war got as close together as possible, placing themselves outside. But we still kept hovering about them till after dark.

"Oh for the *Prince of Wales* and another frigate or two, and we should take the whole fleet and convoy, worth some millions!" said our first lieutenant.

About eight o'clock we perceived three sail at some distance from the fleet; we at once dashed in between them, and gave chase, and were happy to find they steered from the fleet.

About twelve we came up with a large ship of twenty-six guns.

"Every man to his quarters," said the skipper. "Run the guns out, and light the ship up; show this fellow our force, it may prevent his firing into us, and killing a man or two."

No sooner said than done.

"Hoa, the ship ahoy! lower your sails and bring-to instantly, or I'll sink you," shouted the skipper.

Clatter, clatter went the blocks, and away flew all their sails in proper confusion.

"What ship is this?"

"The *Rosa*."

"Whence came you?"

"From Jamaica."

"Where are you bound?"

"To Pensacola" (one of the principal towns in Florida).

"What ship are you?"

"The *Juno*."

Hurrah three times, by the whole ship's company, sounded along the deck of our supposed enemy. An old glum fellow of a sailor, standing close by me, muttered out, "Oh, confound your three cheers—we took you to be something else."

Upon examination we found it to be as reported, and that they had fallen in with the American fleet that morning, and were chased the whole day; and that nothing saved them but our stepping in between.

The other vessels in company were likewise bound to Florida, at that time in our possession.

Thus was all our expected prize-money gone, for the other ships had got so far off that it was scarcely possible for us to overtake any of them. But, however, we determined to make the trial, and we were not long in getting every stitch of sail that she could stagger under upon the *Juno*, and following on in the course of the American convoy. But in this we were disappointed, as you shall hear.

We had not proceeded far, being on the starboard tack, when about six bells (three o'clock) in the middle watch, a man upon the forecastle bawls out, "Breakers ahead, and land upon the lee-bow!"

Our first lieutenant looked out, and it was so, sure enough. "Ready about!—put the helm down!—helm a lee!" he at once exclaimed.

"Now, Edward, as you ought to be a bit of a sailor by this time, can you explain to me the meaning of these last orders?"

"Why, yes, Grandpa ; I think I can," said he.

"By the breakers ahead and land upon the lee-bow, it would appear that the ship was upon a lee-shore ; and by the order to put the helm down, and ready about, the ship being on the starboard tack, it became necessary that the sails should be trimmed or set upon the port tack ; and, as you have explained to us in regard to the action of the rudder and tiller, putting the helm to starboard makes a ship's head turn off (or pay off in the sea phrase) to port. In this case the order to put the helm down (which was to port) was intended to make the ship's head pay off on the port tack, so as to weather or get to seaward of the breakers."

"Very well defined, my boy. And now I will proceed."

The skipper, hearing the lieutenant put the ship about, jumped upon deck. "What's the matter?" he exclaimed. "You are putting the ship about without my orders."

"Sir, 't is time to go about ; the ship is almost ashore. There's the land."

"Why, so it is! Will the ship stay?" (come head to wind).

"Yes, sir ; I believe she will, if we do not make any confusion. She's all a-back forward now."

"Well," says the captain, "work the ship. I will not interrupt you."

The ship stayed very well (that is, she came to the wind); her yards were braced round, and she now bore away on the opposite tack, and left the dangerous vicinity of the land.

But we were not certain of our position. "Heave the lead! See what water we have."

"Three fathom!" called out the man in the chains.

"Keep the ship away, W.N.W.," said the skipper.

"By the mark three," again from the leadsman.

"This won't do," he exclaimed.

"No, sir; we had better haul (steer) more to the northward. We came S.S.E., and had better steer N.N.W."

"Steady, and a quarter three," from the leadsman.

"This may do, and we deepen a little."

"Deep four."

"Very well, my lad; heave quick,"

"By the mark five."

"That's a fine fellow! another cast nimbly."

"Quarter less eight" ($7\frac{3}{4}$ fathom).

"That will do. Come, we shall get clear by-and-bye."

"And a quarter five."

"What's that?" I exclaimed, in astonishment.

"Only five fathom, sir."

"Turn all hands up; bring the ship to an anchor."

"All hands bring the ship to an anchor, hoy!" rang through the decks.

"Are the anchors clear?" asked the officer.

"In a moment, sir—all clear! What water have you in the chains now?" to the man heaving the lead.

"And a half eight, sir," was the answer.

"Keep all fast with the anchors till I call you."

"Ay, ay, sir; all fast."

"I have no ground with this line, sir."

"How many fathom have you out? Pass along the deep sea-line."

"Ay, ay, sir."

"Come; are you ready?"

"All ready, sir."

"Heave away, watch! (water to pour on the line, as it was running out with such velocity as to be almost on fire)—bear away!—veer away. No ground, sir, within a hundred fathoms."

"That's clever; come, it is all right yet. All down but the watch;—secure the anchors again;—heave the main-topsail to the mast;—and bring her to the wind (that is, hove-to).

All but the watch now retired to rest; and as the danger was past (at least, we thought so, but were mistaken, as will hereafter appear), we soon got all to rights again.

I think it necessary, my young readers, for you to understand the difficult position in which we were placed, and the various orders and answers given above, that I should here explain the method of heaving the lead, and how the depth of water is ascertained.

The method of heaving the lead is as follows :—

A good seaman is sent into the main-channels, or chains, as they are called by seamen, where he is secured from falling overboard by a rope passed round his waist, and fastened to the lanyard of the shroud. The lead-line, as its name implies, is a long small rope, to which a weight of lead is attached, to sink it.

The lead-line is marked into lengths of six feet, called fathoms, by knots or pieces of leather or bunting ; where the latter is fixed, whether it be white or red, it is a mark, and the leadsman would call it thus, “by the mark five,” or “by the mark seven,” as the case may be. At ten fathoms a knot is tied ; at fifteen, a mark ; at twenty, two knots ; at thirty, three knots ; and so on. The leadsman accompanies his actions and delivers the number of fathoms with a song to the pilot when one is on board, or else to the officer of the watch.

In narrow and intricate channels it is sometimes necessary to place a man in the chains on each side of the ship, as the depth will vary a fathom or more even in the breadth of the vessel ; and it is of great importance that these men give the soundings (depths) correctly, particularly in stormy or unfavourable weather : as a wrong depth being given might cause the ship to be run aground, when the consequences would be fatal to her, and perhaps to all hands.

Ships have been wrecked in this manner, and many lives lost, the weather and the state of the sea not permitting the escape of the crew in the ship's boats, and the ac-

cident occurring at a place where no life-boat was at hand to rescue them.

The man throwing the lead holds the line in his hand a short distance above the weight ; and, swinging it over his head a few times, to give it impetus, he flings it off from him as far as he can, in the direction of the ship's



course, allowing the line to run out freely (as shown in the annexed sketch). As soon as the weight has touched the bottom (or plumb-ed), and the line is perpendicular under him, he clutches fast and draws it in, calling out the depth —“By the mark seven,” or “By the deep nine,”—according to circumstances. At the bottom of the weight is attached a hollow tube,

into which grease is pressed ; when the weight reaches the bottom some portion of the latter will adhere to the grease ; it may thus be ascertained whether the ground consists of sand, gravel, or mud. If rocks, the grease will be indented, but nothing brought up with it.

I remember some few years since, on the north coast of Devon, seeing a schooner that had grounded upon a shoal or sandbank, at a time when a heavy gale was blowing and the waves were running mountains high.

She was about a mile from the shore. The sea was breaking entirely over her, so that at times nothing but her sails and upper rigging were visible. The situation





LAUNCHING THE LIFE-BOAT.

of the poor mariners was truly pitiable, the boats belonging to the schooner being so small that no attempt could be made to leave in them, for they could not have floated two minutes in so tempestuous a sea; and from the violence with which the waves broke over the ship, it was certain she would soon go to pieces.

The life-boat was quickly launched, and manned by some of those brave sons of Britain who, in any danger, will endeavour to render help to the distressed.



For a time, whilst under the lee of the land, the boat and its gallant crew made rapid progress towards the ill-fated schooner; but as she got farther out, she made but little way. Sometimes she was visible on the top of a huge wave; and at others entirely lost to sight from the shore in the hollow trough of the sea. Still the undaunted crew persevered in their perilous undertaking, and though the sea washed over them continually, every man plied his oar with unabated ardour. (The men, I

should tell you, to prevent their being washed out of the life-boat, lash themselves firmly to their seats.)

After extreme toil they reached the schooner. A rope was thrown from the vessel and secured in the boat, which remained at a short distance off, to prevent its being washed into or crushed against the sides of the vessel. Another rope was now thrown to the boat, and a man in the schooner fixed the end of it firmly round his body, and, watching his opportunity, jumped into the sea, when he was instantly drawn to and taken into the life-boat. The rope was quickly passed to the vessel, and another man securing it round him, plunged into the boiling waters, and was soon safe in the boat. All at length left the schooner, and the life-boat now turned to the shore, having accomplished its beneficent purpose. The men plied their stout oars with renewed vigour, soon reached the shore, and received the congratulations and praises of those who had witnessed their daring efforts in the cause of humanity.

The schooner soon afterwards went to pieces, and portions of the wreck were cast ashore.

Life-boats were invented by Mr. Lutlin, and a patent was granted to him in 1785 ; but one built by Mr. Greathead in 1789 superseded Mr. Lutlin's. It was floated in 1790, and in 1791 it saved the crews of the *Parthenius* and the *Peggy*, and Parliament voted him a reward of £1,200. Since then many improvements have been made, and in 1824 the Royal National Life-boat Institution was founded principally through the exertions of Sir William

Hilary. The number of lives saved during the fifty-four years from the establishment of the institution, to the end of the year 1877, either by its life-boats or by special exertions, for which it granted rewards, was 25,435 ; the number of life-boats belonging to or in connection with the institution, up to 1877, numbered 268.





CHAPTER XVI.

The *Juno* overtaken by a squall—The mainmast sprung half-way through—Fishing the mainmast—Increase of the gale—Double-breeching the guns—Battening down the hatchways—Water in the hold—The pumps manned—Dangerous situation of the ship—The *Juno* scudding—Gale suddenly abates—Safe arrival at Port Royal.

SAILORS are strange beings, and the natures of those comprising our crew could be easily distinguished by their behaviour after our narrow escape. Some few seemed heartily thankful: with others, and by far the greater number, it seemed as if all thoughts of the danger they had just passed through vanished from their minds as soon as it was over; but it appeared that we had no sooner escaped one peril than another threatened us.

The next night we were overtaken by a squall, like a

hurricane while it lasted ; for, though our lieutenant saw it coming, and was prepared for it, yet, when it took the ship, it roared and so laid her down, that I thought she would never get up again. However, by keeping her away (before the wind), and clueing up everything (reducing the sails), she righted. The remainder of the night we had very heavy squalls, and in the morning found the mainmast sprung half-way through (split, and likely to break off). The hurricane months coming on, the land very distant, and the head of the mainmast almost off, was a very bad prospect for us ; "but, however, we must make the best of it," was the gallant speech of our brave captain.

As soon as possible the mainmast was well fished (lashed round with strong ropes) ; but we were obliged to be very tender of carrying sail.

The next night it began to snuffle, and a monstrous heavy appearance rose up from the eastward. This induced us to close-reef the top-sails.

"What sort of weather have we?" asked the captain, as he issued from his cabin.

"It blows a little, sir, and has a very ugly look," said the first lieutenant. "I should be almost inclined to say we were going to have a heavy gale of wind."

"Ay, it looks so very often here when there is no wind at all ; however, don't hoist the top-sails till it clears a little ; there is no trusting any country."

That night, and all the next day, the gale kept increasing. Towards the afternoon it became necessary to make

every preparation for the worst. We therefore reefed the courses (the main-sail and fore-sail); brought-to under a storm mizen stay-sail; saw the boats all made fast; new lashed the guns; double-breeched (double-lashed) the lower-deckers; saw that the carpenters had the tarpaulins and battens all ready for the hatchways (to be put on in case a heavy sea should break over us, to prevent the water rushing down between the decks); and got the top-gallant-masts down upon deck. In fact, did everything we could think of to make a snug ship.

Towards evening it blew tremendously, but still steadily to a point (did not veer about, as frequently occurs in heavy gales). However, we got the hatchways all secured, expecting what would be the consequences should the wind shift. The purser was frightened out of his wits; the two marine officers as white as sheets, not understanding the ship's working so much (rolling and straining her timbers); and the noise of the lower-deck guns, which by this time made a pretty screeching: to people not used to it, it seemed as if the whole ship's side was going at every roll. Chisel, our carpenter, was all this time smoking his pipe and laughing at the doctor. The second lieutenant was upon deck, and the third in his hammock. So you see, my young readers, that the danger did not much alarm the true sailors.

About midnight we found there was some water between decks, but nothing to be alarmed at. Scuttled the deck (bored holes in it), and let the water run into the well. Found she made a good deal of water through the

sides and decks. Turned the watch below to the pumps, though only two feet (depth) of water in the well ; but expected to be constantly at work now, as the ship laboured much, with scarcely a part of her above water but the quarter-deck, and that but seldom.

“Come, pump away, boys. Carpenters, get the weather chain-pump rigged” (fitted for working).

“All ready, sir.”

“Then man it, and keep both pumps going.”

Word was sent from below that the ship still gained on them (the water in the well was increasing), as the men could not stand to the pumps, the ship lay so much along (on her side).

We were tearing through the water, notwithstanding, at a most furious rate, with a close-reefed fore-sail ; and, though scudding in these latitudes, where islands and rocks are so numerous, was rather hazardous work, we depended a little upon the fury of the gale wearing itself out before morning ; and upon the chance that, even if we should run ashore, some portion of the crew might reach the land in safety ; whereas, if we brought-to, the water was gaining so fast upon us that the ship must eventually founder, and all hands perish.

Fortunately, just at this time the gale suddenly abated, and the huge waves, that had been pouring over us, and clearing the decks of everything moveable, gradually subsided. The men were able to stand to the pumps, and, in a little more than an hour we had the pleasing intelligence that the water was decreasing in the hold.

This, from the dangerous situation we were in only one hour before, when, if the gale had continued, every soul on board must have perished, now made all hands almost mad with joy. As daylight broke soon after, and the sea gradually lessened, we were enabled to put the ship a little to rights. However, to continue to cruise in our present leaky and disabled state would have been madness ; we therefore, as soon as possible, got the ship under as much sail as she would carry ; and, with several hands at the pumps,—the carpenter and his mates busy at work stopping leaks,—the caulker the same,—and all hands beside doing what they could, we made sail for the nearest port, where we could get a refit. The next day, towards evening, we got into Port Royal, in Jamaica. Here we found the *Prince of Wales* and the rest of the squadron, which had put in the previous day, having also encountered very severe weather. I soon got amongst my old messmates, who congratulated me on my escape. Fortunate, indeed, we were ; for many ill-fated ships, with all their crews, were lost during this tempestuous weather.





PIRATES.



CHAPTER XVII.

Informed of pirates being in the neighbourhood—A man-of-war schooner sent to search for and destroy them—Virginia pilot-boat—Curious phenomena—The flying-fish and the dolphin—The alarm given by Grandpa's dog—Attack of the pirates—Their capture and fate—Wreck discovered on a reef near Cuba—Boat sent to board her—Horrors of shipwreck—Only two passengers saved.

NOT the least among the dangers of the mariner's life in the merchant service are those inflicted by pirates ; they are reckless of human life, and although not so numerous now as formerly, the history of the cruel deeds of these wretches is heartrending.

Information having been received at head-quarters that some pirates were committing great ravages amongst the shipping of the Bahama Islands, a fast-sailing schooner

for a considerable distance, and generally capture the poor little fish, notwithstanding all his efforts to escape. When pursued by this monstrous foe of his race, the flying-fish takes long flights through the air, several hundred yards at a time, dipping into the water only for an instant, as if to wet his wings, and again skimming through the air ; now changing his course to one side, to elude his pursuer, then flying off in the opposite direc-



FLYING-FISH.

tion ; but all in vain, as the rapid progress of the dolphin perceptibly decreases the distance between them, and the least deviation in the course of the winged tenant of the deep is soon discovered by its inveterate pursuer. At length the strength of the flying-fish fails him, and when he dips into the water he does not rise so nimbly from its surface. His every succeeding flight is shorter, and the dolphin is close to his prey. In terror the flying-fish again takes wing, but the untired dolphin, who appears to have calculated the strength of his victim, and the distance of its last flight, has reached the spot where it terminates ; and, instead of dipping into the water, it is received into the open mouth of its relentless foe, who, nowise fatigued by

his late exertions, stretches out again in pursuit of others of the flight of flying-fish. But to return to our subject.

I was pacing the deck, now and then playing with my faithful dog and almost constant companion, Neptune, when he suddenly left me; and running to the side of the vessel, and, resting his forepaws on the bulwark, looking eagerly forward, as if endeavouring to trace out some object amidst the intense darkness of the night, he uttered a short anxious bark.

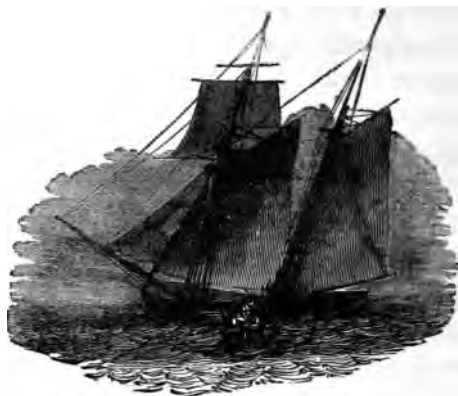
One of the men advanced to the dog, and, patting him on the head, said, "Eh! **Nep**, what is it, my dog? speak to them, **Nep**."

The dog, without changing his attitude, gave a long low growl. Lieutenant Lanyard, who commanded the schooner, at this moment came on deck.

We instantly became interested in the motions of the dog, as we knew enough of the dangers of the sea to prevent our neglecting a warning, and it was evident the dog either saw or heard something that was beyond the reach of our sight and hearing. I now listened attentively, and a sound as of the dip of oars in the water reached my ears, and presently I could distinguish the bright plashing of the water (from the phosphorescent appearance I have spoken of) as the oars dipped into it. A large boat was evidently approaching us. "Look out—hail that boat," said I to the men. It was done, but no answer was returned; again we hailed, and with no better success.

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This puzzled us very much ; in fact, we did not like the appearance of the matter at all, and thought it but right to prepare for the worst. "Boatswain's mate," said Lanyard, "pipe all hands—quick, my men ; get your cutlasses and arms." It was well we did so, for a large row-boat, or canoe, was now alongside, pulling six oars of a side, and with about twenty-five men in her. The



next instant they had hooked on to our quarter, and at least twenty unlooked-for visitors scrambled up the side and jumped on board. All this was so sudden that but few of the crew were ready to receive them ; but these were fortunately the prime men of the ship.

"Surrender, you scoundrels," I shouted, "surrender ! You are on board a man-of-war ; if you do not drop your arms this instant, you are all dead men." Either not understanding me, or not believing what I said, one of them attacked me with a cutlass.

Lanyard now at the top of his voice called out, "Cut them down, boarders!—down with them! they are pirates! Heave cold shot into their boat alongside!—Boatswain, call all hands."

A desperate struggle ensued; our assailants had no fire-arms, but with their long knives and swords, which they used with desperation, several of our men were cruelly wounded.

The pirates, for such they were, though they had found out their mistake, were not yet conquered; and, in the utter darkness, we were almost afraid to strike a blow, lest it should fall on a friend. By this time all our hands were on deck, and some of the pirates had fallen to rise no more. They made a rush to where they had fixed their boat; but their escape was rendered impossible by that method, as the heavy shot thrown into her had gone crashing through her bottom, and she was swamped. For some time they fought in a body; at length, however, they separated and were pursued singly to various parts of the ship, but they were not vanquished. I ran to the binnacle, where a blue light was stowed away, and fired it. By its light we tracked the desperate ruffians. Some were killed, others wounded and taken prisoners; the remainder jumped overboard, with the view of swimming to the shore. In this they were foiled, for the sparkling of the dark water as they passed through it, pointed them out to the marines on board, who with their muskets shot them man after man.

We secured our prisoners, who were all blacks and

mulattos ; and the most villanous-looking ruffians that could be seen.

At this time a heavy shower of rain fell, accompanied by vivid lightning. The effect of the rain was most extraordinary, as the drops fell in quick succession into the water, which became by its phosphoric appearance almost like a sea of fire. A ship lying near us was struck by the electric fluid, and her main-topmast carried away close to the cap. Four of her crew were killed by the shock, and several more were stunned. Our ship happily escaped this misfortune.

Now, my young readers, lest you should feel surprised at the fact I have stated, of the pirates being shot by the marines whilst endeavouring to escape, when they were not in a position to do us any further injury, a little explanation will be necessary. I should tell you that the life of a pirate is always considered a forfeited one, as they are always men of the worst character, and live only by plundering vessels they fall in with and can master. They are men stained with the blackest crimes ; for, on capturing a vessel, they seldom spare any of the unfortunate crew, murdering them all in cold blood if they have not made any resistance, and in revenge, if otherwise. If the vessel is not considered worth taking to their haunt, they plunder her of everything valuable that they can carry away ; and having bound the unfortunate captain and his crew, to prevent their making any efforts to escape, they will either set fire to or scuttle the ship by boring holes through her bottom. This admits the

water into her, and she gradually sinks with her helpless freight of human beings, and is no more heard of. Such events as the above in former years were but of too frequent occurrence, and it may well be supposed that many missing ships have perished by these means, and not by the fury of the winds and waves. Many parts of the globe are infested with these ruffians—fiends, I may almost call them, in human form. Among the West India Isles, they are frequently met with; also in the East Indies, where the Malays add to the darkness of their countenances by their still darker and cruel deeds. In the Mediterranean Sea they have been encountered; and on the coast of Algiers (in Africa) many events of such relentless and unparalleled cruelty could be told, that would harrow up the soul and almost chill the blood of the hearer. I regret to state—to their utter disgrace be it spoken—that Englishmen have been found vicious enough to join these lawless bands.


Is it, then, my young readers, a matter of wonder that these wretches, who possess no sentiment of awe of the great Being who created them, and no feeling of regard for their fellow-man—is it surprising that, the arm of the pirate being against every man, every man's arm should be against him? As I have stated, their lives are always forfeited. If taken prisoners, they have a trial, like any other felon; but if attempting an escape, and no other means of recapturing them is feasible, they are subject to be shot; and awful is their fate when summoned to stand before His dread tribunal, before whom the best must tremble.

After this circumstance some weeks passed away, during which we were constantly cruising about, and no incident worth relating occurred. One fine morning, when standing in towards the land, not far distant from Cuba, the look-out man at the mast-head hailed, "A wreck lying upon the weathermost point of the long reef." (The weathermost point is the one farthest out at sea, and most exposed to the weather.)

It had been blowing very hard, and there was a good deal of motion in the water ; but Lieutenant Lanyard considered that a boat could live (float in safety) in it. He therefore determined to heave-to, and endeavour to send her assistance.

Our lee quarter-boat was lowered, and, accompanied by several sturdy hands, I pulled towards the wreck. As we neared her, we discovered that she was a large brig, which had lost both her masts just above the deck. As we approached, we passed the floating carcasses of several bullocks and various portions of the wreck.

When we got under the lee of the reef, we were in comparatively smooth water, and were enabled to examine a little into the appearance of the wreck. We discovered that all her boats were gone, which, as we did not see any of the crew on board, induced us to believe she was forsaken, and that they had escaped to the shore in them, as otherwise they must all have been carried away by the sea. It appeared the vessel must have unconsciously run upon the reef during the darkness of night, as her masts, which were broken off, were hanging



over the side, and still held by the standing rigging (shrouds and stays), which had not been cut away; all her sails were attached, and were floating about beside her.

The brig lay on her beam-ends; and over the fore part of the vessel the sea was making a clear breach, and washing about the carcasses of several other dead bullocks, which were much decomposed; and it thus became evident that the wreck had been some time in her present situation. On getting on board, a piteous scene presented itself. Sheltered from the sun and the fury of the sea by a piece of canvas, we discovered, lashed to the ring-bolts in the stern, the lifeless forms of several females—some of them with infants firmly clasped in their embrace, but also dead. In the round-house at the stern were two other females, who were alive, but reduced to perfect skeletons. We were fortunate enough to get them on board our own ship; and, under the care of the surgeon, they recovered.

From them we learned the reason that we had seen none of the crew nor any male person on board the ill-fated ship. It appeared she was an emigrant ship, and, as we supposed, had struck on the reef during the night.

The account detailed to us of the sufferings of the unfortunate women, when deserted and left to perish, as they thought they were, by their husbands and friends, was truly heartrending: when day by day passed away, and no boat returned to them; when the calls of hunger became intense, and there was nothing to relieve them. Twelve days had thus passed, and, one after another,

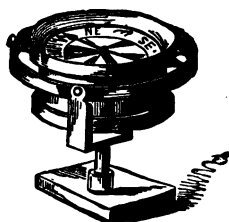
their companions had perished before their eyes ; and such, in a short time, would have been their fate also, had we not discovered the wreck as we did.

But I will not dwell longer on this melancholy tale. The two survivors procured friends at Cuba, who assisted them to return to the country they had left, where they had relatives, and where they would, doubtless, long retain the memory of this their first unhappy voyage, and of the perils and dangers incident to those traversing the mighty deep.

“The queenly ship !—brave hearts have striven,
And true ones died with her !
We saw her mighty cable riven
Like floating gossamer !
We saw her proud flag struck that morn,
A star once o’er the seas,
Her helm beat down, her decks uptorn,—
And sadder things than these !

“We saw the strong man, still and low,
A crushed reed thrown aside !
Yet by that rigid lip and brow,
Not without strife he died !
And near him on the seaweed lay—
Till then we had not wept ;
But well our gushing hearts might say
That there *a mother* slept !”

—MRS. HEMANS.



CHAPTER XVIII.

Grandpa returns to Port Royal—Rejoins the *Prince of Wales*, which is ordered to join Lord Hood's squadron in the Mediterranean Sea—Fore-reaching—To heave-to—Weather and lee—Sailing close to the wind—Lee-way—The star-board tack and the port tack—The compass, latitude and longitude, and their uses—The log—A knot—A side wind, and difficulty of steering—Relieving tackles to the tiller.

A WRECK is one of the saddest sights that sailors see, when on long voyages far from any human aid but that of their own stout hearts and strong arms ; but these, with a tight ship and a good look-out, enable them to weather many dangers that would appal a landsman. A sailor's life is one of constant activity, and as the time for the *Prince of Wales* to remain on the West India station had now expired, we bore up for Kingston.

Orders had been received for the ship to join the squadron in the Mediterranean, which was watching the motions of the French fleet. This was joyful intelligence, and we began to think that we should at last get a little prize-money to take to England with us.

As nothing particular happened during the voyage to the Straits of Gibraltar, I have nothing to relate to my readers about it. I will, therefore, take this opportunity of mentioning something about the log and the compass, and the method of ascertaining the position of a ship at sea by means of the quadrant; and what is called dead reckoning, which, as Jonathan would say, "I reckon" will be more useful to most young people, and make them better acquainted with the subject of this work, than a relation of the events on board a ship during a dull voyage.

I will commence by telling you the meaning of the term fore-reaching.

When two vessels are sailing in the same course or direction, and the sternmost ship passes or goes ahead of the other, she is said to fore-reach upon her.

When a vessel is sailing under her topsails, &c., and is required to be hove-to to allow a boat to come alongside, or for any other cause, the operation is performed by slacking the lee and hauling in the weather main-braces, so as to throw the main-yard a-back and lay the main-topsail to the mast; in which position the wind is acting upon the main-topsail in a contrary direction to the other sails, thereby stopping the ship's way (progress through the water), and rendering her stationary.


When a ship is sailing, the side upon which the wind blows is called the weather side, and the opposite one the lee; and the rigging, &c., is designated by the terms weather and lee, such as the weather-braces, lee-braces, weather-yard-arm, and lee-yard-arm, &c. Sometimes to

the helmsman the order would be, "Put the helm a-lee" or "a-weather," instead of "port" or "starboard."

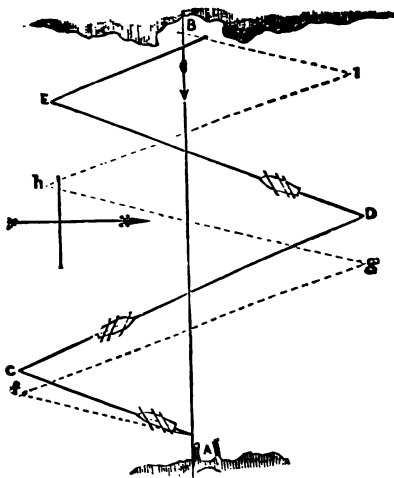
A square-rigged vessel—such as a brig or three-masted ship—cannot sail closer to the wind than six points. Suppose a ship's course to be due west to reach her port of destination and the wind is blowing due west, she will then have what is termed a head wind, and to make her voyage will be obliged to resort to the operation of beating or tacking to windward, by first sailing or making a long reach on the port tack, and then making a reach on the starboard tack.

If a vessel does not possess good sailing qualities, she will make considerable lee-way in such a case, whereas a good sailing ship, in two tacks of 100 miles each, may have advanced twenty miles on her voyage in the space of forty-eight hours.

The lee-way is a bodily sideway motion, and is better explained by the diagram, wherein the point A is the starting point of the ship, and B her destination. The line with the arrow on it points the direction of the wind and the straight course of the vessel, but as she cannot sail closer than six points to the wind, her course would first lie along the line A C. This is called the starboard tack. Arriving at the point C she would "go about" (turn) on the line C D, which is the port tack. From D she would again go about on the starboard tack along the line D E, and from E she would have another short reach to make on the port tack, which would bring her to her destination, B.



The dotted lines, terminating in the points f, g, h, i, show the course a vessel would take if she could not sail so close as six points to the wind.



Ships that make lee-way are those which, after making several reaches on each tack, are but little advanced on their voyage—if not, as it sometimes happens, really farther off.

Now, my young readers, for you to understand the meaning of the term “sailing six points from the wind,” you should examine the card on the compass, wherein the points and their different names are shown. In a compass, the needle is fixed under the card, and, as everybody knows, always points to the north.

The names of the different points, commencing with

North, and going round the circle on the right hand, are as follows:—N, North; N b E, North and by East; N N E, North North-East; N E b N, North-East and by North: N E, North-East; N E b E, North-East and by East; E, East. The other points are designated in a



similar way, only substituting the words South, East, and West, for S, E, W, as they occur.

The points of the compass are thirty-two in number. I will now tell you how much a point is, and what connection it has with the course a ship is sailing. To do this, I must refer my young readers to their geography book, wherein they will find that the circumference of the earth is divided into 360 parts, called degrees, each degree being equal to about 69½ miles.

You will also see, by looking at a globe, or map of the world, that a series of imaginary lines, or circles, are drawn

round it, in an east and west direction, commencing from the poles, and increasing gradually in diameter, until they reach the broadest part of the earth ; which line is called the equator. These lines are called the parallels of latitude. Other lines are drawn in a north and south direction, dividing the equator into 360 parts, or degrees, but meeting in a point at the North and South Poles ; these are called the lines of longitude. By these lines, the latitude and longitude of any place being given, it is readily found out on a globe or map. The mariner having ascertained this, the direction in which he must sail is denoted by the compass.

Now, to apply the use of the compass to the above, we will suppose a ship to be at the Cape of Good Hope, and her destination to be Ceylon, a large island in the Indian Ocean. If we divide the circumference of the globe, in a north and south direction, into thirty-two parts, to represent the thirty-two points of the compass, we shall find that a line drawn from the centre point in the N.E. quarter to the centre would be in the same direction, or nearly parallel to a line drawn from the Cape of Good Hope to the island of Ceylon ; therefore, in sailing thither, the ship's head must always point north-east, to reach it. Or if the wind is not fair for her to sail in the true direction, she must resort to the method, before described, of beating to windward.

The progress a ship has made on her voyage is discovered in two ways ; either by observation of the sun with the quadrant—by which means her latitude and longitude

may be discovered ; or calculated by what is called dead reckoning, with the log.

The log is a triangular piece of board, fastened to the end of a line called the log-line, upon which, at equal distances, are a number of knots. It is thrown from the stern of the vessel, and remains vertical and stationary in the water ; at which instant, the order is given to a man with a sand-glass in his hand, to "Turn." The log-line is then allowed to run out freely, until all the sand has run through the glass, when the man who holds it calls out "Stop." The line is now drawn in, and the number of knots run out are counted off ; the rate of sailing is thus found to be nine or ten knots per hour, as the case may be. A knot signifies a nautical mile.

This operation is continued at stated periods, or when any particular alteration in the force of the wind is discoverable. The rate at which the ship sails at any particular time is noted down, and the distance traversed each day registered. By this means, her progress or position can be ascertained at any time.

When a ship is sailing with a side wind, and it blows hard, she is laid so much down on her side as to render the steering very difficult, as the ship will have a constant tendency to come to the wind ; in which case, from all her sails being suddenly taken a-back, there is a possibility of her being driven down stern foremost ; when, if on a lee-shore, she is certain to be wrecked. To prevent such an occurrence, extra power is required in the steering department, and four men are placed at the wheel, and

perhaps eight or ten more at the relieving tackles in the gun-room. Relieving tackles are ropes fixed to the tiller, and held on by men, to take a portion of the strain off the tiller-ropes, when a ship is in a heavy sea, and the waves strike the rudder with such force as to threaten to carry it away altogether. In fact, this sometimes happens and is attended with considerable danger to the ship.

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CHAPTER XIX.

Pilots—Frigate in distress—Signal for a pilot—Pilots going off—Perilous situation—Reaching the frigate—Manner of getting pilot on board—Fire-ships—A man overboard—The life-buoy—Death on board—A funeral at sea—Lines on the occasion—Scawood banks—Gibraltar—Attempts of the allies to retake the fort.

I will now tell you something about pilots. There are numerous pilots attached to every port; these men, from constant sailing about, become thoroughly acquainted with the intricacies of the navigation, and are therefore of great service in or out of port with safety. A pilotage office was established at Deptford about the year 1700.

Homeward-bound ships are attended by pilots of much experience much

perhaps eight or ten more at the relieving tackles in the gun-room. Relieving tackles are ropes fixed to the tiller, and held on by men, to take a portion of the strain off the tiller-ropes, when a ship is in a heavy sea, and the waves strike the rudder with such force as to threaten to carry it away altogether. In fact, this sometimes happens, and is attended with considerable danger to the ship.





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• I WISH now to tell you something about pilots. There are now regular pilots attached to every port ; these men, from constantly cruising about, become thoroughly acquainted with the intricacies of the navigation, and are therefore able to conduct ships in or out of port with safety. A society for their training was established at Deptford on the river Thames in 1514.

Homeward-bound ships frequently experience much

cumbrances, and to prepare for the next attack. The gale, with its mighty breath, swelled her reefed sails almost to bursting, and again she moved forward, whilst her crew crouched snugly down with halliards and sheets all clear (all ready to let go if required). Once more rolled in the broken wave, curling over and roaring loudly as it advanced. The boat again met it and dashed through the wall of water, but was half swamped (half filled with water) before it had passed astern. The danger was past—the helm checked to starboard, the sheets eased off, and away she flew to succour the distressed frigate, or, in other words, perhaps more intelligible to my readers, she was set to run nearly before the wind.

Hundreds of persons were on the piers to see the boat make her dangerous passage through them. They watched her with almost breathless silence whilst the frightful danger was impending. Many a long-drawn sigh of terror passed as the noble craft was immersed in



the foam of the dark waters, but not a word was spoken till she had got over and passed the whole; and then the loud and continued shout of congratulation and praise burst forth, and mingled with the shrill whistling of the gale.

The captain, and many on board the frigate, had fixed their eager attention on the movements of the hovellers. They could distinctly see the crowds of people upon the pierheads, and as the boat came out of the harbour, they became aware that at least the signal for a pilot would be answered. The captain gazed through his glass with the most intense anxiety. He saw the daring efforts and the hard toil of the brave hovellers, he saw the waving of hats and handkerchiefs on the piers as the boat was making her way rapidly towards him, and, seized with the enthusiasm of the moment, he whirled his hat above his head, exclaiming, "Nobly done! nobly done! Hurrah!" The officers and seamen heard the sound, and one loud and hearty cheer rang along the decks. It was the brave answering the brave.

For some distance the pilot-boat kept on towards the ship. She then altered her course towards the Downs, the steersman waving his hat for the frigate to follow.

As they got closer preparations were made on board the frigate to receive the pilot as soon as the boat got alongside. A seaman was sent up to the main-yard-arm, who from thence let down the end of a hawser (rope) to touch the surface of the water.

On came the pilot-boat, every man of her crew at his proper duty, and his eyes steadily fixed upon the sails without heeding the frigate. Onward she came, tossing up the bubbling water, and dashing it from her bows, as if in play with the element she braved. The steersman's duty was now one that required great care; and, as he

got closer to the frigate, he turned the boat into the same course she was steering. Soon they were alongside, and a man in the bows caught the rope suspended from the yard-arm, and secured it round one of the thwarts (seats across the boat). The end of a rope was thrown from the gangway of the frigate to the boat, and secured round the body and under the arms of a sturdy-looking man, who threw off his rough jacket on the occasion. The roll of the sea was watched for ; the boat moved closer to the ship, the rope was hauled taut, and the man jumped from the gunwale (edge of the boat) into the space between. For an instant he was under water, but was quickly raised to the surface, close to the ship's side, where plenty of hands were ready to receive him : he ascended the steps, crossed the gangway, and the pilot was on board.

The boat now returned to the shore, and the frigate pursued her course and providentially reached her port in safety.

I will now tell you something more about fire-ships, and after this I must proceed with my own tale.

The fire-ship, which in former days used to be attached to fleets of war, was intended to be run alongside of, and lashed and hooked to, a disabled ship of the line (an enemy) that would not surrender. This cruel and dishonourable method of warfare has of late been abandoned on the open sea, and was used the last time at the burning of the French fleet, at Isle d'Aix, in Basque Roads.

The way in which these ships are fitted up is as fol-

lows:—Fore and aft, between and under the decks of a fire-vessel are laid long tubes of combustibles, which burn and smoke, but will not blow up. In the hold of the vessel are three separate magazines, filled not only with the same kind of combustibles, but with a quantity of buckets, having hooks at their ears and handles, also filled with this slow consuming fire.

These buckets are known by the name of *stink-pots*. At the bottom of the magazines is laid a considerable quantity of shells, hand-grenades, and round hollow balls, filled with a composition which, once ignited, cannot be extinguished until it is burnt out.

When the vessel blows up, which she does ultimately, these balls fall on board the enemy; and if he has escaped the fire before, he is pretty sure to take it after the explosion.

At the yard-arms, jib-boom ends, and in other parts of the fire-ship, attached by chains, are grapnels (a species of anchor with several flukes or hooks), which, once hooked, are with difficulty, if ever, extricated, but by cutting the rigging in which they entangle.

When a fire-ship is ordered upon service, the trains are all laid by the gunner, and, as soon as she is fairly alongside the enemy, and the crew are in their boats, the captain sets fire to the fuse attached to the train, which is cut to burn one minute and a half. If he is successful he is promoted; but if he is taken by the foe, he is hanged at the yard-arm of their ship.

One evening, during our voyage across the Atlantic, a

sudden cry resounded through the ship ; it was—"Man overboard ! Man overboard !"

This created great commotion, and every one was on the alert, striving which should be the first to render assistance. In an instant one of the quarter-boats was manned and lowered to the water, and the seamen pulled with desperate energy to the spot where their unfortunate shipmate had fallen.

In former years, during a dark night, such an accident occurring was almost certain death to the ill-fated sailor; for unless he was a good swimmer, and could exert his voice to let his messmates in the boat know his position, there was but little chance for him. Lately, a machine called a life-buoy has been invented, which has doubtless saved the life of many a brave seaman.

The life-buoy is kept suspended over the taffrail. It is an apparatus composed of two thin hollow copper balls, connected by an iron rod, and so poised as to float upright.

On the cross-bar is an upright rod, at the top of which is attached a port-fire, which, in the event of a man falling overboard in the night, is lighted by means of a gun-lock at the instant it is dropped into the sea, converting it into a floating beacon, to direct both the man overboard to it, and the boat's crew which may be sent to pick him up. This is the more essential, as large ships, having much headway, will run a mile before they can be rounded-to (stopped) ; in which case the man, as I have before stated, would in all probability be lost, but for

this clever and humane contrivance. Orders have been issued by Government for all ships in the navy to be provided with these life-buoys.

In the days I am speaking of ships were not so provided ; but, however, on this occasion we were fortunate enough to recover the sailor who had thus had such a narrow escape for his life.



THE LIFE-BUOY AT NIGHT.

A few days after this occurrence, one of our crew, a quartermaster died ; and as we were far from land, we were obliged to give him "a sailor's funeral."

It was the first I had witnessed ; for, although during the time I had belonged to the *Prince of Wales* several hands had died, the melancholy events had occurred in ports, where a regular grave could be provided for the deceased.

A funeral at sea is a very affecting scene ; and many a sunburnt, hardy and brave man have I known who could not restrain the tear of sorrow and sympathy for his departed companion and messmate.

The following lines on the subject will I think, interest you, and give you an idea of the scene :—

THE FUNERAL AT SEA.

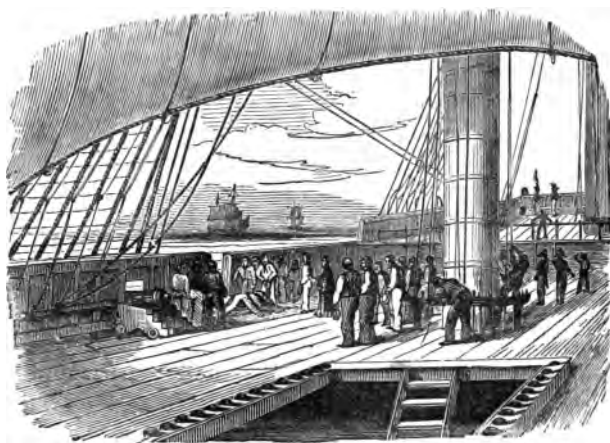
Deep mists hung over the mariner's grave,
When the holy funeral rite was read ;
And every breath on the dark blue wave
Seemed hushed to hallow the friendless dead.
And heavily heaved, on the gloomy sea,
The ship that sheltered that homeless one,
As though his funeral hour should be
When the waves were still, and the winds were gone.
And there he lay, in his coarse, cold shroud,
And strangers were round the coffinless ;
Not a kinsman was seen among that crowd—
Not an eye to weep, nor a lip to bless.
No sound from the church's passing bell
Was echoed along the pathless deep,
The hearts that were far away to tell
Where the mariner lies in his lasting sleep.
Not a whisper then lingered upon the air ;
O'er his body, one moment, his messmates bent ;
But the plunging sound of the dead was there,
And the ocean is now his monument.
But many a sigh, and many a tear,
Shall be breathed, and shed, in the hours to come ;
When the widow and fatherless shall hear
How he died, far, far from his happy home.

—FINN.

A sailor's funeral is conducted in the following manner :—

As soon as a seaman dies the surgeon reports it to the officer of the watch ; and, at whatever time of the night or day it happens, the captain is immediately made acquainted with it.

The deceased is prepared for his "deep-sea grave" by his messmates, who, with the assistance of the sail-maker, in presence of the master-at-arms, sew him up in his hammock, putting a couple of shot at his feet. The body is then carried aft, and placed upon the after-hatchway, or on the half-deck, with the Union Jack thrown over all.



A FUNERAL AT SEA.

Next day, at about eleven o'clock, the bell is tolled for the funeral; and all who choose to attend assemble on the gangway and around the mainmast, whilst the fore part of the quarter-deck is occupied by the officers.

While the people are repairing to the quarter-deck, the body is moved by the messmates of the deceased, and placed upon the lee-gangway, where an opening is made

large enough to allow the body to pass. (It is still covered with the Union Jack.) While the messmates arrange themselves around, a rope which is kept out of sight, is made fast to the grating upon which the body rests.

When all is ready, the chaplain (if there is not one on board the captain or any of the officers may officiate) reads the service for the dead. On coming to the passage, "we therefore commit his body to the deep," &c., one of the sailors disengages the flag, and the others launch the grating overboard; when the body, loaded with the shot at one end, glances off the grating and plunges at once into the ocean, where it must remain until earth and ocean give up their dead at the dread summons of the Creator. Happy they who at that time have their names written in the Book of Life.

After the funeral the grating is hauled on deck, and all hands return to their duties.

The day after the above occurrence we met with one of the immense banks of seaweed common to the Atlantic within 40° of latitude, on either side of the equator, although the currents sometimes drift portions of them upon our coast.

It is remarkable that, although detached and floating, they seldom move about much, and are generally met with on the passage from the Cape of Good Hope, or from Monte Video, in South America. It was one of these banks which terrified the crews of the vessels under Columbus, who superstitiously believed that the hindrance was designed by Heaven to stay their adventurous

course, and implored him to return in consequence, declaring that it was presumptuous impiety to attempt to proceed.

These banks of seaweed sometimes extend many miles, and ships have been known to be several days getting through them.

A few days after this we reached Gibraltar, of which I must give you some little description.

The town and fortress of Gibraltar stands upon a rock at the entrance of the Mediterranean Sea. It is the most southern point of Spain and of Europe, and is divided from the coast of Africa by a narrow channel, called the Straits of Gibraltar.



FELUCCA OFF GIBRALTAR.

In 1704, while the Spanish and French nations were struggling for the possession of it, Admiral Rooke, with a small squadron of English ships, arrived in the bay, and, from the weak state of the garrison, succeeded in

gaining possession of it, with the loss only of sixty killed and 220 wounded. This circumstance was very much like a quarrel between two little dogs for the possession of a bone, in the midst of which a big dog comes along, and walks off with it, effectually settling the *bone* of contention.

For many years several unsuccessful attempts were made by the Spaniards to retake it. The most remarkable was that at the time of the old American War, under the orders of the Duc de Crellon, when it was defended by General Elliott. This siege lasted four years.

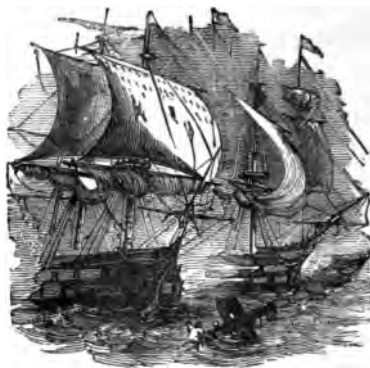
The number of rounds of shot fired by the allies (the French and Spaniards) amounted sometimes to 1,000 a day; and the whole number, on both sides, amounted to upwards of 500,000. Amongst other means used to take it, the allies had ten floating towers, mounting 200 guns; these were so contrived as to be both ball and bomb-proof. As they annoyed the English exceedingly, recourse was had to heating shot red-hot, which, penetrating the wood, set them on fire, when they were destroyed, together with the brave men who served them. From that time to the present Gibraltar has remained in the possession of the English.

In summer time the weather is extremely hot, and cases of plague and yellow fever occur; but, generally speaking, it is very healthy. This rock is, for the most part, inaccessible, and upon it are numbers of monkeys, which afford amusement to the spectators by their *strange* antics. There are also some remarkable caves;

but its chief value to England is that it serves as a key to the Mediterranean in war-time, and as a depôt and harbour for shipping.

The town of Gibraltar is built on the western front of the island, and is very strongly fortified, though its chief protection is derived from the batteries on the neighbouring heights. The houses have flat roofs and large bay windows ; they are generally painted black, with a white line to denote each storey or floor. One large street traverses almost the whole town, and is full of shops. The bay is of large extent, and is protected from the most dangerous winds.





CHAPTER XX.

Arrival at Malta—Joins Lord Hood's squadron—Falling in with the French fleet—The action—Curious manner of taking a prisoner—Pat Donegan's mistake—Grandpa is wounded—The cheer—The seventy-four on fire—Blowing-up—Result of the battle—Ordered for England—Description of Malta—Volcanic island—Gunboats—Siege of Calvi—Inspection—Church service—Arrival at Spithead.

SOME of the crew got an opportunity of stretching their legs at Gibraltar, but the time allowed was very short, and it was with some difficulty that all could be collected to go on board, not, indeed, before the ship had fired a gun as a signal of recall ; for I can assure you that to men cooped up for so long, a run on land is eagerly enjoyed. Our course was up the Mediterranean as far as **Malta**, where we joined the squadron under Lord Hood,

which was on the look-out for the French fleet. This was an anxious time, and almost every man was looking out ; some with glasses scanning the whole horizon, others ascending the rigging, and every one anxious to see it first.

We ne'er see our foes but we wish them to stay,
They never see *us* but they wish us away ;
If they run, why, we follow, and run them ashore,
And if they won't fight us we cannot do more.

—*Hearts of Oak.*

The English force amounted to ten sail of the line—viz., our ship, *The Prince of Wales*; *The Royal Sovereign*, of 120 guns, on board of which was the commander-in-chief Lord Hood, with the immortal Nelson as her captain ; two 98-gun ships, and six seventy-fours ; besides which we had ten frigates ranging from 24 to 50 guns, and several corvettes, sloops of war, and gun-boats. After several days' cruising we fell in with the French squadron, which amounted to fourteen sail of the line, with a still larger proportion of frigates, corvettes, &c., than we had.

It was a splendid sight to witness the different ships tacking and moving about according to the signals made from the mast-heads of the admirals' ships on both sides, as they formed into line of battle.

Our opponents appeared to be rather undecided in their movements ; first stretching out in one line and showing a bold front, then forming into double line, and again into single line ; first on one tack, and then on the

opposite, and so on, until our commanders got impatient, and the men began whispering to one another "that they shouldn't wonder if the Frenchmen wouldn't try to get away altogether if they could."

The same thoughts appeared to have struck our admiral, for he made the signal for all our ships to form in order of battle, and in a single line to bear down upon the enemy.

The wind at this time was upon our port quarter, and the nearest of the enemy's ships were about two miles to windward of us.

Seeing that we were determined to come to an engagement, the French admiral hove-to to watch our manœuvres, and to be in readiness as our ships approached to give us a broadside in return for the one we intended to "salute him with."

On came our line, and as each ship got within range a terrific discharge of cannon from both sides burst on the scene, filling the air with dense clouds of smoke which for a time rendered invisible the position of friend or foe. Presently, however, we discovered the French admiral's ship bearing up with the intention of passing our stern and raking us.

This would not do at any rate, for in this position a ship suffers more particularly in the loss of her men than in any other case; and for this reason, that one ship passing the stern of another, and discharging a broadside into her, the shots pour in and sweep through the whole length of the decks, the carnage which ensues being dreadful.

At the moment we saw the Frenchmen approaching us we were standing full on the port tack ; we immediately hove about on the starboard tack, and so quickly did our gallant ship answer her helm, and so alert in trimming the sails were our brave sailors, notwithstanding the showers of shot flying about them, that we were enabled to give our opponent the favour he had designed for us, as we crossed his bows and poured a whole broadside right along his decks. After this we again hove about, and were now on the lee of the enemy, presenting broadside to broadside.

The ships of both fleets had singled out their opponents, and so incessant was the firing that the wind, which when the action commenced had been a stiff breeze, had now completely lulled, and all the ships appeared becalmed, which is a frequent occurrence in close actions. The air also became so densely filled with smoke that every object was invisible a few feet only from us ; and the continued roaring of the guns, with the crashing of the timbers in all directions, had rendered every man nearly deaf.

For some time our opponent returned us broadside for broadside, and the destruction of human life in both ships was very great : many poor fellows who had risen in the morning full of vigour and hope, had now fallen to rise no more ; and many more had been removed by their comrades to the cockpit to receive the assistance of the surgeons, some with the loss of a leg, some with both gone, others with broken arms, or various severe wounds, by

which they were so dreadfully mangled and mutilated, that it would but harrow your feelings to detail them.

The ships had now drifted close together; in fact, their sides touched; and one of the Frenchmen at a gun on the lower deck, was taken prisoner in rather a curious manner. He had two or three times, when the man who was ramming home the charge in the gun, in the port-hole of our ships, which was close to him, taken advantage of the opportunity to push forward a boarding-pike, and actually pricked the man with it. This repeated annoyance was too much for the feelings of Pat Donegan, an Irishman, and he at last exclaimed, "Arrah, now, my honey, and can't ye be quiet?" Again was the pike protruded; but this time Pat was prepared for him, and, seizing a boat-hook that was near, suddenly thrust it forward and caught the Frenchman by the collar. So sudden was the movement, that he had actually pulled the fellow out of the port-hole of his own ship, and drawn him partly into ours, before his comrades were aware of the circumstance. It was now too late for them to render any assistance to him, and Pat drew in his prisoner and sat him down on the deck beside him, exclaiming, "There now, Mounseer, you sit still there, and be aisy, or maybe I'll have to tache ye the difference atween French and English manners, and that, too, in a way ye won't like overmuch." This circumstance, notwithstanding the deadly strife which was going on, occasioned a perfect burst of laughter from all who witnessed it. Another event in which Pat performed a part occurred shortly after; it was this:—a poor fellow

near him had both his legs broken by a splinter, and Pat seeing him lying on deck, went to inquire what was the matter. The poor fellow told him, and asked him to carry him down to the cockpit. The man immediately took him on his back, and was proceeding below with his burden, when a shot passing at the moment struck the disabled man in the head, and smashed it to atoms. The Irishman, unconscious of this second disaster, proceeded to the cockpit with the headless trunk of the poor man, and was quite astonished at one of the surgeons saying to him, "Why, Pat, what is the use of your bringing us a man without a head?" "Arrah, now," said Pat, "and sure he told me that it was only his legs, poor fellow!" I should not have mentioned this circumstance, but to show you the revulsion of feelings that such a scene as a battle must occasion in the minds of human beings, when the death of a fellow-mortal can be spoken of so lightly. But such is the case; and though before entering into action many hearts tremble for the result, yet after the first or second discharge of the guns they become steeled to everything, and a comrade killed by their side will perhaps only occasion the remark of "Poor Tom, he's gone!" as the body is thrown overboard; while perhaps the next victim may be the man who made the exclamation.

It is after the battle is over, and only then, that the true feelings of human nature again come into play; when the thinned ranks of one's messmates tell of the horrors of war; when anxious glances are cast around for the sight of some dear friend. Now the man who in the heat of

the strife could jest upon a fallen comrade, scarce dares to ask where is Harry, or where is Ned ; and would rather remain with the faint hope that he is only wounded and under the doctor's care, than by asking the question be told at once that his messmate is no more.

But to return to our subject. The ships had drifted apart some short distance, and for a time, as if by mutual consent, firing had ceased in both. We did not know whether the enemy had struck or not, from the dense mass of smoke which enveloped every object around us. As this gradually rolled away, we discovered that the Frenchman's foretop-mast was broken off and hanging by the rigging. Her sails and cordage were most dreadfully cut up, but the admiral's flag was still flying at the main, and we knew she had not surrendered. Our own ship had suffered a great deal, her sails and rigging being in little better plight than our opponent's.

Not much time elapsed, however, before we recommenced the action, as there was evidently an inclination on the part of the enemy to haul off ; but that was not what we wanted ; we did not mean her to slip through our fingers quite so easily. The broadside we gave, however, was quickly returned.

At this time, as I was standing on the quarter-deck, a shot struck the mainmast, knocking the splinters about in every direction ; one of which unfortunately struck my leg just below the knee, and injured it so much that I had to go below. I will pass over the tale of my own sufferings, and those of the poor fellows around me,

merely remarking that I was fortunate enough to escape without amputation.

Whilst lying in my cot after the limb had been dressed, a tremendous cheer rang through the decks, and many of the poor wounded fellows around me endeavoured to join in it. They well knew its meaning, and the cry of "Victory!" was caught from man to man.

Although one foe had struck to us, our ship was evidently engaged with another opponent, and that pretty warmly too, for her guns were discharged with the utmost rapidity. This proved to be the case, as I was told by one of my messmates who had received a musket-ball in his arm, which had broken it, and was come to have it dressed.

From him I learnt something of what was going on with the other ships. It appeared that Nelson was in his glory, with a three-decker of 120 guns on one side of him and a seventy-four on the other, and that he was returning the favours of each with as much dispatch as possible; in other words, death and destruction were abroad, and hurrying many into the presence of their Maker, whether prepared or not for the awful change.

Another cheer now sounded through our ship: our new enemy had surrendered, and the firing ceased. But guns were still to be heard from some ships in the distance, which were still in combat. Both the ships engaged with Nelson had struck, but the seventy-four was on fire. Nelson was therefore obliged to haul off with his larger prize, to prevent his own ship catching the

flames. The seventy-four having surrendered, of course every effort to save her crew was made, as it was found impossible to stop the ravages of the devouring element. Boats were dispatched from every ship near for this purpose. It was attended, however, with considerable danger, for as many of the seventy-four's guns were loaded, as the flames reached them they became heated and went off. But most of the crew were saved ; those only who lay wounded in her cockpit were the exceptions.

It was impossible to relieve them, for now the flames had enveloped the ship fore and aft ; and frequent explosions took place, as boxes of powder and cartridges which had been got ready for serving the guns were ignited.

The evening had now closed in ; it was dark, and the battle ceased. Besides the seventy-four I have spoken of, two other ships were on fire at some distance from us, but whether friend or foe we could not tell. We ascertained shortly after that one was an English 40-gun frigate, and the other a French 50-gun ship ; but the fire in both was shortly extinguished, and not much harm done.

As I lay on my bed of suffering I heard about midnight a sudden and terrific report, followed by a rumbling sound like the rolling of peals of heavy thunder. The Frenchman had blown up, and pieces of flaming timber, and even some human bodies, were cast into the air. The ship continued burning until she was consumed to the water's edge, when the remains of the hull went to the bottom.

Those of the enemy's ships which had not surrendered hauled their wind during the night, and got away ; leaving us the victory, with fourteen prizes—namely, two 120-gun ships, two of 100 guns, four from 74 to 84 guns, and six frigates and corvettes ; so that on this occasion, with the seventy-four burnt, they lost fifteen vessels.

In the morning the remains of the French squadron were discovered hull down, making the best of their way to Toulon. Some of our best sailers who were in a condition to do so, made off after them ; but they did not get up with them, as the wind was light. From the peculiar build of French ships they sail better in light winds than ours ; but we generally fore-reach upon them in a stiff breeze. On this occasion, as the French ships got under the protection of their own coasts, our ships were obliged to haul off, and make the best of their way to rejoin the fleet.

We had done pretty well for one day, with fourteen prizes, and more than 6,000 prisoners.

I must pass over the accounts of the killed and wounded on both sides, as it is a subject on which I am sure my young readers would not wish me to dwell.

Immediately after the action most of the fleet, with their prizes, proceeded to Malta for a temporary repair of damages, after which our ship was ordered for England.

A few words here, descriptive of Malta, may perhaps be interesting to my readers. This island lies opposite to the south angle of Sicily, from which it is about 60 miles distant. It is 17 miles long, and about 8 miles in

breadth at its broadest part. Its coast is generally steep and rugged. Every portion of the soil is cultivated with the greatest care, and where the soil is deficient, the deficiency is supplied by bringing shiploads from Sicily. It has a healthy climate; frost and snow are unknown. Indigo, saffron, and cotton are successfully cultivated. Indeed, most of the vegetables of Europe and Africa are easily grown. The Knights of St. John of Jerusalem occupied it in the sixteenth century, and they erected many fortifications, and defended it against the repeated attacks of the Turks.

The approach to Valetta, which is at the eastern end of the island, is very picturesque. The first, or northernmost harbour, is used for the purpose of quarantine, where, to prevent infection, ships with their crews, who have come from places infected with disease or plague, are compelled to remain a certain number of days, without any intercourse with the shore, until it is proved that no cause for fear exists; to ascertain which, proper officers are appointed. A vessel under quarantine has always a yellow flag flying at the mast-head, as a signal of the fact. A heavy penalty is awarded for a breach of the quarantine laws.

The southern, or principal port of Malta, is large and safe, and the water so deep close to the shore, that a line-of-battle ship may go alongside the quays, and take her supply of water and provisions without using her boats.

The harbours are guarded by forts on both sides, with

four ranges of guns, the lowest range being nearly level with the water. This island is of great importance to this country as a station for ships and as a garrison for soldiers.

Amongst other phenomena to be met with in the Mediterranean is the frequent rise and fall of volcanic islands. One of these suddenly appeared in the neighbourhood of the coast of Sicily. A party in a boat set off one moonlight night to explore it, one of whom gives the following description :—"A little before sunrise we were warned of our proximity to the island by sundry explosions, and at a short distance saw two hills surmounted with smoke. This island had arisen upon a sandbank well known to the fishermen. We proceeded towards it, and, when within a short distance, the sun rose magnificently behind it, shining through the smoke with a most singular effect. We commenced our examination on the north-west side, where it rose about 120 feet above the sea, but were deterred from approaching it by a dense white cloud of smoke which issued from that side. We rowed round, keeping at about 20 feet from it, till on the east side we found a flat sandy shore which seemed to afford a good landing.

"After some minutes' hesitation, one of the sailors, followed by myself and others, leaped ashore, and found a tolerably firm footing. No one caring to advance at first, one of the party went forward alone, and seeing some bright yellow sand, exclaimed, there was plenty of gold, when the rest set off after him, but soon found

themselves deceived. Observing, however, that the footing was tolerable, we scrambled up to the edge of the crater, within which, at about 45 feet depth, were two small lakes of boiling water. In the first the water was a light yellow, in the second reddish, and both bubbled up and emitted vapour.

"We now returned to the beach, and while amusing



ourselves by examining the stones, ashes, &c., which had been thrown up, we found a fine sword-fish, stupefied and

half dead. This we secured and took to the boat; it weighed about 60 pounds.

"In continuing round the mount, we were obliged to keep nearly a mile off on one side, as the air was so charged with sulphur that we could hardly breathe. Here we saw immense clouds of smoke and steam, rising as it were out of the sea to the height of 2,000 feet or more. Some months after this island totally disappeared, to be perhaps formed again in some other place, as it is evident that the bottom of the sea in this neighbourhood is charged with materials for forming volcanoes."

In due time our damages were repaired, and we now made sail for England.

"Yes! the hope of return is the joy of a tar—

'Tis his compass, his helm; 't is his guide and his star;

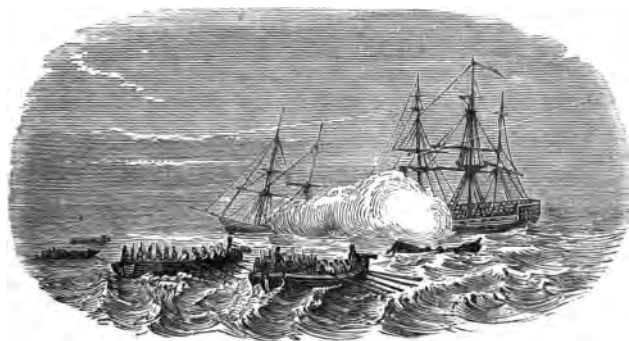
'T is impressed on his bosom the moment he sails—

It shortens long nights, and it quickens light gales."

—*Sea Song.*

About a week after we got through the Straits of Gibraltar we passed Cadiz, on the south-west coast of Spain, where Lord Nelson was busily engaged with the enemy, in which service he had a number of gun-boats.

Gun-boats are large row-boats, fitted to contain a number of marines as well as seamen, rowing and carrying a swivel-gun at the bows. They are principally used in what are called cutting-out expeditions. The annexed cut is a representation of one of these, in which a number of gun-boats are engaged in cutting out two of the



enemy's ships, a frigate and a schooner; who in their turn are endeavouring to beat off their assailants: one of the gun-boats may be observed sinking from a shot having struck her and knocked her to pieces. The frigate is guarded by a strong netting, called a boarding netting, which is suspended from the rigging on all sides. This net for a time prevents the seamen from getting on board the ship, during which they are exposed to a tre-

mendous fire from the enemy ; their only resource is to cut away or destroy it—a very dangerous undertaking, but frequently done. To insure attention among them, Nelson was accustomed to row among the boats after they had been ported for the night.

The Spaniards had, on their part, equipped a number of gun-boats and large launches as a necessary defensive precaution, in which they also rowed guard to prevent the blockaders making so near an approach as otherwise they might have done.

In consequence of these mutual preparations frequent skirmishes took place. In one of these Lord Nelson and the Spanish commander were personally engaged ; the former in his own barge with its usual complement of ten men and a coxswain, and Captain Freemantle as a volunteer ; the Spaniard in a galley of twenty-six oars and thirty men.

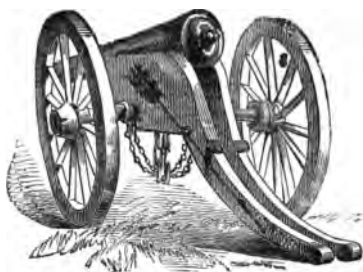
The Spaniards, confiding in their numbers, did not shrink from the contest ; the crews therefore of both boats fought desperately hand to hand.

John Sykes, an old follower of Nelson, saved his life twice by parrying the blows aimed at his commander ; and actually interposed his head, receiving a cut intended for the admiral.

The Spaniards continued to fight till eighteen of them were killed, and the rest, including the Don himself, severely wounded. The conquest of the enemy was then achieved, and the proud superiority of Englishmen never was displayed in more glowing colours.

Having mentioned Admiral Nelson, I cannot refrain from stating another case in which his daring and hardihood were conspicuous: it was at the siege of Calvi.

Twenty - five _ pieces of heavy ordnance (cannon) were dragged up to the batteries, mounted, and all but three fought by seamen, with only one artilleryman



CANNON.

to point the guns. Calvi surrendered after a siege of fifty-one days. The loss from the enemy was not great, but Nelson received a serious injury; a shot from one of the enemy's batteries striking the ground near him, drove the sand and gravel with prodigious force into one of his eyes. This accident, with all its attendant anguish, was incapable of forcing him from his post. With a ribbon tied over his inflamed eye, he persisted in directing the batteries till the last gun of the enemy was silenced, and Calvi surrendered. He wrote to Lord Hood the same day, but complained little; in fact, he suffered the accident to confine him only one day; but the sight of the eye was irrecoverably lost.

Whilst the *Prince of Wales* is proceeding on her homeward voyage, I will give you an account of the inspection and church service of Sundays on board a man-of-war.

At seven o'clock in the morning the hammacks are

pipéd up, and stowed in the nettings. The decks having had a double washing on the Saturday, are cleaned and carefully swept, so that everything may be in order for divine service.

All the falls of ropes are flemished down (carefully and closely coiled) ; after this the crew is pipéd to breakfast. The word is then passed for muster at five bells (half-past ten o'clock), with the order to appear in " duck frocks and trousers, or blue jackets and trousers," according to the weather and the climate. At one bell, that is, half-past eight, the first watch is called, and the ship is swept clean in every part ; when this is finished, the different mates * report to the warrant officers, and they to the first lieutenant, who goes round to see all ready for the chief inspection. The captain then desires the lieutenants to tell the officer of the watch to "beat to divisions," which is done by the drummer. The ship's



crew then range themselves in a single line round the fore-castle, along the gangways, both sides of the quarter-deck, and round the main-deck. The marines are drawn up across the after-part of the quarter-deck. The lieutenants, with the midshipmen, are each at

the head of their respective divisions, in full uniform.

* Now sub-lieutenants.

The captain then visits every part of the ship, inspecting everything closely. The men are then dismissed, and the church is ordered to be rigged on the quarter-deck ; in bad weather on the main-deck. A binnacle or compass-box is used for the pulpit, from which the chaplain reads the prayers and delivers his sermon. The officers sit around on the chairs taken from the captain's cabin and ward-room, and the men manage with mess-stools, capstan-bars, tubs, or the gun-carriages. They are screened from the sun by awnings spread overhead. During the service a pendant (flag) is hoisted at the peak ; and when it is over the men have the remainder of the day to themselves, excepting those who perform the duty of the ship, which is still sailing onward, and must be attended to.

It was on a bright morning in May when we hove in sight of land—when our native shores again met our view. And oh ! how anxiously did every one look forward to the moment when he should be allowed to go on shore. At length we arrived at Spithead, where we anchored and saluted the port admiral. Shortly after orders came for the ship to be paid off, to go into dock for a thorough repair.

At the appointed time all hands obtained their wages, and every man quitted the ship to revisit his home, to tell of his disasters, to relate to his wondering friends the scenes and adventures he had met with, and to spend his money. Unfortunately for him, a Jack Tar is seldom at his ease whilst he has any in his pocket, and it is fre-

quently lavished away by him in a most thoughtless and careless manner.

We had mostly done pretty well in this voyage, had lost but a few hands considering the very hazardous services we were engaged in, and had all got something considerable in the way of prize-money to receive.

After leaving the ship, I soon hastened home, where I was now alone master, my dear mother having died while I was at sea, as I have already told you. Everything about me was strange and uncomfortable, and after remaining at home only a few months, I again sought employment, which, after a time, with my uncle's assistance, I obtained, and went out in a sloop-of-war as senior midshipman, when we accompanied a convoy. For further information on this subject my young readers will permit me to draw their attention to the next chapter.





CHAPTER XXI.

The convoy—Sloop-of-war—Merchant ships—Indiamen—East India Company—Madeira—Vessel attacked by a privateer—Hailing the ship, &c.—The rescue—The privateers taken—Barbadoes—Sail for Pensacola—Nelson in the *Albemarle*—Breakers ahead—Curious agitation of the water—The water-spout.

VESSELS bound for foreign ports in war-time are accompanied by men-of-war, to protect them from falling into the hands of an enemy. On these occasions a large number of merchant vessels assemble, which, when sailing under the protection of men-of-war, is called a convoy.


On this occasion there were more than 200 sail of merchant vessels ; and a most splendid sight it was as they all got under weigh from the Downs. Amongst them were ships of every class and description. Richly orna-

mented Indiamen that, to all outward appearance, looked like men-of-war ; barques, also three-masted vessels, but without square topsails to the mizen, and as large as 800 or 900 tons burthen ; brigs, vessels with two masts, both square-rigged.

The cabins of the Indiamen were fitted up in a superb style ; having their windows draped with damask silk, their sides richly panelled, and the mouldings and cornices gilded ; whilst harps, pianofortes, and other musical instruments were provided for the passengers.

The East India Company was at the time in full power and activity. It was originally founded by charter in the year 1600, and this charter was from time to time renewed, until in 1743-4 we find the Company lending the Government three millions, at three per cent. per annum, for renewing their charter. At this time they were all-powerful in British India ; but in 1773 an Act was passed for the better regulation of the Company, and in 1774 the British Government appointed Warren Hastings the first Governor-General ; other appointments and alterations were afterwards made, and finally the powers of the Company were transferred to Her Majesty the Queen in 1858, and all monopoly in the trade to India was abolished. Her Majesty assumed the title of Empress of India in the year 1876.

Besides those mentioned above, there were schooners and sloops, and some Dutch vessels, which had availed themselves of the protection of our men-of-war, against the French, an enemy they had to dread.



A sloop is a vessel with one mast, carrying a foresail, jib, and flying-jib. The sail which in square-rigged vessels, like the brig and frigate, is called a spanker, is, in a sloop or cutter, called the mainsail. She also carries a gaff-topsail, like a schooner; but cutters, which are similar vessels, carry, in addition to the above, a large square yard, upon which is set the square mainsail.



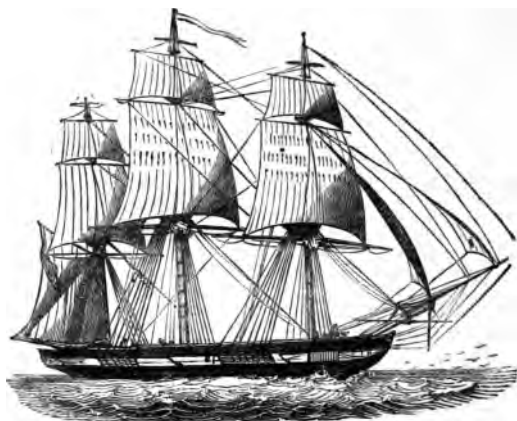
The protectors of this large fleet of ships were a line-of-battle ship, of 100 guns, which led the van; two frigates, of 44 guns each; and three sloops of war, besides cutters and tenders.

The frigates and sloops-of-war, being fast sailers, had no regular station, but kept cruising about the fleet, to take care of the dull sailers and stragglers.

We made Madeira in about a fortnight, but did not anchor, continuing our course for about three weeks without anything particular occurring, when one fine evening, after we had progressed considerably into the "trades," and were within 300 miles of Barbadoes, we happened to be the sternmost of the men-of-war, and had the agreeable task of whipping in the sluggards.

It had been a most beautiful day, the sun had set

bright and clear, and we were running along before the wind—sometimes called running on a bow-line (in which position the yards are right across the deck). There was no moon, and although the stars shone out brilliantly, it was dark. The commodore fired a gun, and showed a number of lights (a signal for the sternmost ships to make more sail, and get close up). We repeated the



signal, and stood on, hailing the dullest or slowest sailers of the merchantmen to make more sail, and firing a musket-shot now and then over the more distant, to keep them awake. By-and-bye we saw a large merchant ship suddenly “haul her wind,” and stand across our bows. (This was done by bracing up the yards into an oblique direction across the deck.)

We could not understand what was the reason of *this*; and our first lieutenant ordered a marine, who

was standing by him, to get a musket, and fire over her.

This was done, and the ship immediately bore up on her course again (right before the wind, as before), and we ranged alongside of her, on her larboard quarter.

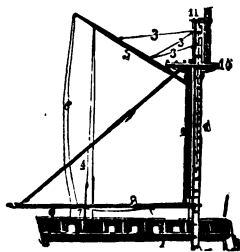
"Ho! the ship, ahoy!"

"Hillo!" was the reply.

"Make more sail, sir, and run into the body of the fleet. Why don't you keep in the course of the commodore?" (the officer in command of the squadron is designated by this title). "What did you mean by hauling your wind just now?"

A very unintelligible reply was given to this question, and our lieutenant concluded that something was wrong. We hailed them again, ordering them to heave-to,* and

* The ship is said to be hove-to when the main and main-topsail-yards are braced up in a contrary direction to the fore and fore-topsail-yards. This causes their sails to be filled by the wind in opposite directions, and has the effect of stopping the ship's way (progress). The position of the sails in this case is shown in the drawing of the slaver brig hove-to at page 270. The light at the peak is a lantern hoisted to the end of the gaff. The ropes by which the gaff is hoisted are called throat and peak halliards. The throat halliard is the rope fixed to that end of the gaff which slides up and down the trysail-mast; and the peak halliard is a rope rove through blocks on the gaff, and between the cap and round-top of the mast, as represented in the sketch.



No. 1, the *mizen-mast*; 2, the *trysail-mast* (the throat halliards

to hoist a light at the peak, as we should send a boat on board of them.

We had hove-to, and were in the act of lowering a boat to send to her, when the officer rattled out, "Keep all fast with the boat. I cannot comprehend what that fellow is about: he has not hove-to." Once more we were close to him, and we hailed to know why he did not heave-to, but received no reply.

Presently we could perceive a confusion and noise of struggling on board, and angry voices, as if people were trying to force their way up the hatchways from below; and a heavy thumping on the deck, and a creaking of the blocks, and a rattling of the cordage; while the main-yard was first braced one way, and then another, as if two parties were striving for the mastery. At length a voice hailed distinctly, "We are captured by a——" A sudden sharp cry, and a splash overboard, told of some fearful deed.

"We are taken by a privateer or pirate," sung out an-

lead down beside it); 3, 3, 3, the peak halliards; 4, the vang; 5, the gaff; 6, the signal halliards, at the peak; 7, the topping-lift; 8, the boom; 9, the after part of the ship; 10, the mizen-top; 11, the cap.

Outside the head of the sail are two ropes called vangs, which are brought down to each side of the ship; their use is to steady the gaff. At the extreme end of the gaff, called the peak, is a small block, through which the signal halliards are rove.

Another stout rope, leading from the trussel-trees to the end of the boom, is called the topping-lift; this raises and carries the weight of the spanker-boom.

other voice. This was followed by the sound of a heavy blow, and all was again silent.

By this time all hands had been called in our ship; and the word was passed to load two of the foremost carronades with grape-shot (a number of iron bullets made up in a cluster, and all fired at the same instant).

"On board, there—get below, all you of the English crew, as I shall fire with grape," hailed our captain.

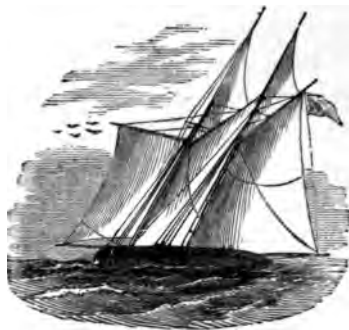
This hint was taken; but we did not fire, as the ship came to the wind (broached-to), and we rounded-to under her lee (her starboard quarter); and a boat, with a lieutenant, myself, and twenty hands, armed with cutlasses, were sent on board.

A horrible scene presented itself when we reached her deck. At the gangway (which, you will recollect, is in the waist or middle of the ship) we found a dead body—doubtless the poor fellow who had hailed us last—and the mate lashed to a ring-bolt, and gagged. When we released him, he told us the ship had been surprised by a privateer schooner; the second mate, who hailed us first, was stabbed, and thrown overboard; and the unfortunate man killed at the gangway was the boatswain. The vessel's crew were all confined in the fore-castle.

We found that the master and twelve men belonging to the privateer were now in the cabin.

We immediately released the men, and armed them;

and hailed the ship, to let our captain know we were safe on board.*



PRIVATEER SCHOONER.

Our ship, the *Zephyr*, then made chase after the schooner, which she captured.

I accompanied the lieutenant, with our men, down to

* The annexed diagram, with its explanation, will render the situations of the two vessels, referred to in the preceding pages, more intelligible to my readers.

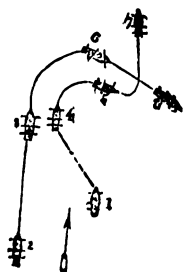


Fig. 1 represents the place of the Indiaman, when she first hauled her wind ; 2, the position of the sloop-of-war, a little astern of her ; 3, the place of the sloop-of-war, when she ranged up alongside the Indiaman, at 4. Fig. 5 shows the place of the Indiaman, as she came to the wind, or broached-to ; and 6 is the position of the man-of-war, when she hove-to under the lee quarter of the Indiaman. Fig. 7 denotes the Indiaman steering her proper course into the body of the fleet ; and 8, the man-of-war, bearing up in chase of the privateer schooner. The lines between the vessels represent the course in which each moved.

the cabin, where a truly horrible scene presented itself. But, as it is not my intention to describe the horrid scenes that in war-time, I am sorry to say, are constantly brought before our eyes, I will only state that, having captured the lawless wretches who had been the perpetrators of such shocking crimes, and released the captain and passengers of the merchantman, whom we found strongly pinioned, we got the vessel into her course again, and made all sail into the body of the fleet.

We at length arrived at Carlisle Bay, Barbadoes, where the privateer's crew met their reward ; that is, they were all hanged.

Barbadoes is one of the Caribbees, and the most eastern of the West India Islands. It is about twenty-one miles long, and about fourteen broad. It contains four towns ; viz., Bridgetown the capital, Speight's Town, Austin's Town, and Jamestown. Its population is very great, and said to be about 100,000.

The next day we weighed, and sailed with the trade winds for Jamaica, where we arrived in about a week. Here we had despatches to deliver to the admiral of the station ; and, having performed this duty, and had two or three days' run ashore, we departed with a portion of the convoy, to Pensacola, in Florida ; the other ships taking the remainder of the convoy to their various destinations. We arrived at Pensacola without any event of consequence occurring. Here we remained only a few days, and sailed again for Jamaica.

Whilst in this latitude, I must mention a rather curious

event which happened to Lord Nelson—I say happened, although he, in his judgment, had calculated upon something of the sort occurring.

Some time after Captain Nelson had joined Lord Hood, in the West Indies, the admiral having received several contradictory accounts of the number of the enemy's ships at the Havana, and being consequently unable to rely on such varying reports, was desirous of sending, for the requisite information, one on whom he well knew he might depend. Captain Nelson was dispatched upon this business, which he executed with his usual success.

He reflected that the *Albemarle*, which he commanded, from its once being a French ship, might easily be taken for one on this occasion. Having, therefore, sailed for the Spanish Main, he hoisted French colours, and lay off the Havana harbour.

While he remained in this situation, a king's launch (large boat), belonging to the Spaniards, and filled with scientific gentlemen in search of specimens in the various branches of natural history, passed near; and, being hailed in French, came alongside, without suspicion, and answered all the questions that were asked respecting the number and force of the enemy's ships.

The astonishment of the crew is not to be described, when they found themselves prisoners of war on board an English frigate. The worthy captain soon satisfied them that they had not fallen into the hands of freebooters; and, in consideration of the scientific pursuits in which they were engaged, the manner in which they had been

captured, and the requisite information with which they had furnished him—he told them (after having entertained them with the best his table could afford) that they should be at liberty to depart whenever they pleased.

Two or three days after we sailed from Pensacola, the weather, which had been squally, unexpectedly lulled, and the sea abated considerably; when one morning we were very much surprised to hear the man at the mast-head sing out to the officer of the watch, "Breakers right ahead, sir."

"Breakers!" said the officer, "it is impossible; the man must be mad."

"Breakers close under the bows," sung out the boat-swain, from forward.

The officer instantly rushed to the forecastle, while I kept close to his heels.

We looked out ahead, and there we certainly did see a splashing, and boiling, and white foaming of the ocean, that unquestionably looked like breakers. Gradually this splashing and foaming appearance took a circular whisking shape, as if the clear green



sea, for a space of a hundred yards in diameter, had been

stirred about by an immense ladle, until everything hissed again ; and the curious part of it was, that the agitation of the water still preserved its distance ahead of us ; for as we progressed, so the breeze appeared to float it onwards.

At length the whirling circle of white foam ascended higher and higher, and then gradually contracted itself into a spinning black tube, like a funnel or trumpet, with the bell or broad end in the clouds, and the small one resting on the water.

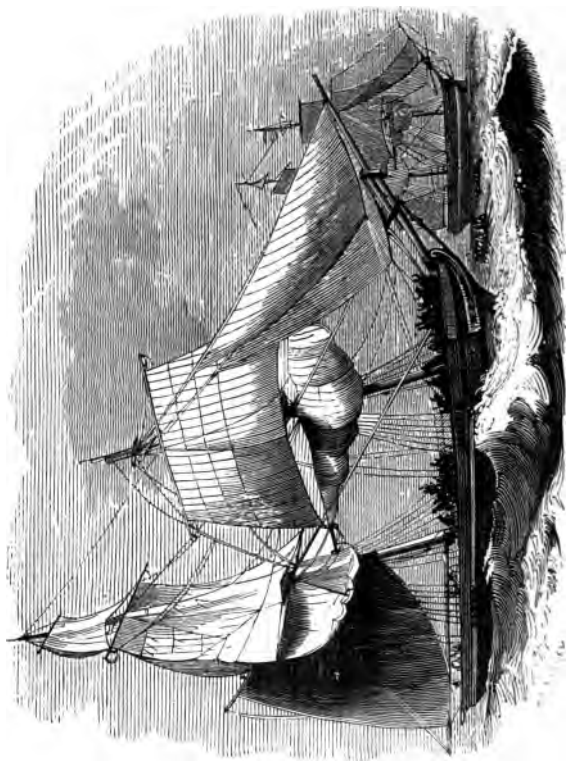
"Is the boat-gun, in the forecastle, loaded?" asked the captain.

"It is, sir," was the answer.

"Then bring it to bear on the column, and fire."

The gun was discharged, and down rushed the black wavering pillar in a watery avalanche ; and in a minute after, the dark heaving billows rolled over the spot it rose from, as if such thing had never been.

This troubling of the waters, my young readers, was a waterspout, which is neither more nor less than a whirlwind at sea, which gradually whisks the water round and round, as you may have seen straws carried up by the wind—until it is raised in the form above described to the height of 100 feet or more, when it will break of its own weight, if left to do so ; but a sudden concussion of the air, from the discharge of a cannon, is nearly certain to disperse it.



SLAVER BRIG HIVE-TO. MAN-OF-WAR IN THE OFFING.



CHAPTER XXII.

the slaver—Mutiny of the slaves—Its result—The captain of the fore-castle and the drowning boy—Arrival at Jamaica—The *Prince of Wales* joins the squadron—Ordered to the East Indies—Crossing the line—The Souffleur—Adam's Peak at Columbo, Ceylon—The pearl fishery—Bay of Bengal—Catching dolphins—The squall, and its effects—Jury-masts—The *Olympus*—Madras—Massulah boats.

WE were soon doomed to see something of the horrors of the slave trade, now happily of less frequent occurrence than in the time of which I am writing. All honour to Wilberforce and those who acted with him in rousing public attention, which induced the English Government to take such decided steps in the matter, that in all British possessions (and now also in the United States of America) slavery has ceased to exist.

Four days after we saw the waterspout, a large brig hove in sight, and showed American colours ; we bore up "to speak her," and as we came within hail we heard a pistol-shot, and saw a negro fall into the water.

We supposed at first that it was a negro who had died, and who, as is usual, had been thrown overboard ; but the next instant we saw him rise struggling on the surface, and shortly after he sank again to rise no more. We were now close to the vessel, and I was sent with a boat's crew to board her, having ordered her first to heave-to, which she did.

A scene of horror presented itself to me on mounting her deck, which exceeded all I had ever witnessed. The brig had a cargo of slaves from the coast of Africa, consisting of some scores of children under twelve years of age, confined in spaces which would scarcely allow them to sit upright. With nothing but the bare planks to lie upon, the constant rolling of the vessel had worked their joints into wounds, and the poor little creatures were perishing with hunger.

Four young men wounded and in fetters were on the gangway, who otherwise did not seem much the worse for the voyage. Another was placed astride the gunwale, with his hands pinioned behind him.

Seated upon the companion abaft (the entrance of the stairs leading to the cabin) was a stout man, whose clothing was stained with blood ; his head was bound round with some cotton, through which the blood was oozing and his left arm bound up—evident signs he had been in

a severe conflict. This was the captain : most of his crew appeared to be more or less hurt, and all were evidently intoxicated. The captain was about to discharge a pistol at the negro, when I struck his arm up, and the pistol went off in the air. I thus saved the poor fellow's life.

I learned that these poor famished children had devoted a part of their daily rations to the support of their elder companions, to give them strength to overcome the master and crew of the brig, and with the ship to regain their native land. In this they had failed ; and the poor fellow we had seen thrown overboard was the ringleader, whom the captain had shot when we heard the report of the pistol. As the brig proved to be under the protection of a neutral flag (and at this time we had no power over a slaver), after having censured the captain for his brutality, and rendered matters a little more comfortable for these unfortunate beings, we left them, so the vessel continued her course, and sold her cargo as slaves at the port to which she was destined. The poor negro whose life I had saved, I purchased of the captain, of course giving him his freedom ; and he continued with me a faithful servant for many years afterwards, until removed from this world by death.

Some few years since the English Government, by paying a sum of money amounting to £20,000,000, purchased the freedom of all the slaves in our colonies, since which time the traffic is forbidden, though it is persisted in occasionally. Our cruisers have orders to re-capture slaves whenever they have an opportunity ; and some fast-

sailing vessels are frequently sent out into the regions where this inhuman traffic is carried on, to seize any vessels which may have slaves on board. The poor creatures thus recaptured are sent to the English colony of Sierra Leone, on the coast of Africa ; others to their own country, if they wish it, to which some also return from Sierra Leone : but when they arrive at the latter place, they are so well assured of the protection afforded them by residing in one of our colonies, that they seldom leave it, as on returning to their own country they are likely to be again seized and sold as slaves—an event which has frequently occurred.

Sailors are comical fellows ; and although Jack likes his glass of grog, does not always do a good action merely for the sake of it, as the following will show :—

During a calm one day, some of the people were bathing alongside ; a studding-sail being spread upon the water suspended from the main and fore-yard-arms, and forming a secure bath for the use of those who could not swim. Some of the boys belonging to the ship were amusing themselves by floundering about, and at times venturing outside the leech-rope (edge of the sail). One of the least of them being taunted by his more expert companions with being afraid, boldly struck out, but had got only a short distance when his heart failed him, and losing the power of keeping his head above water, he began rapidly to sink, to the horror of his companions, who could render him no assistance.

The captain of the fore-castle, a tall fine-looking man,

was standing on the shank of the sheet anchor, with his arms crossed, apparently asleep, and leaning against the fore-topmast back-stay. He had, however, been attentively watching the young party all the time, fearing that some mischief might ensue; and grunting out a warning to them from time to time, to which they paid no attention.

At last he desisted, saying, "they might drown themselves for anything he cared, for never a bit would he help them;" but no sooner did the sinking figure of the little boy catch his eye, than, joining his hands over his head, he plunged in, and, rising again with the bewildered boy in his grasp, and calling to the others to take better care of their companion, he chucked him right into the belly of the sail.

The fore-sheet hanging in the calm nearly in the water, he scrambled up by it to his old station on the anchor, shook himself like a great dog, and then proceeded across the fore-castle to shift himself.

The marine officer, who had seen the occurrence from the gangway hammock-nettings, stopped him, saying, "That was very well done of you, my man, and deserves a good glass of grog; tell the gun-room steward to give you a stiff north-wester on my account." The offer was well meant, but badly timed, so at least apparently thought Jack; for although touching his hat instinctively when spoken to by an officer, he made no reply till the marine was out of hearing, when he said to his messmates, laughing, "Does the good gentleman think I will take a glass of grog for saving the boy's life?"

Shortly after the above occurrence we again reached Jamaica. By this time the *Prince of Wales* had arrived, and in company with her the *Olympus*, 74.

We ascertained that these ships were to proceed to the East Indies, and that we should join company.

I was exceedingly glad to hear this, particularly as I found that my kind uncle was still in command of her, and wished me to join him. An exchange of midshipmen from one ship to another is easily managed, and on the following day I once more stood on the deck of the *Prince of Wales*.

As soon as the ships were in proper order for the cruise we made sail, accompanied by the *Olympus*, 74, and the *Zephyr*, sloop-of-war, for the East Indies.

Proceeding on our voyage, we in due time passed the Cape of Good Hope without any event worth relating.

On crossing the equator, however, I should tell you, my young friends, that the usual ceremonies were performed, for a sailor will have his joke, and on crossing the Line it is always a general holiday.

When a ship approaches the Line, preparations are made by the crew for their sport. One of the hands, a captain of the forecastle, is dressed up to represent Neptune, while another passes for Amphitrite his wife; they are attended by a guard of honour, and the band strikes up "Rule Britannia." Neptune holds in his hand a harpoon as a trident; and he and his wife, seated on a gun-carriage for a car, proceed in state, attended by the crew dressed as sea-monsters, from the forecastle to the

quarter-deck, where they hold their court. All like it very well, except the fresh hands, who have to undergo no very pleasant usage. After being treated like a king upon the quarter-deck, Mr. Neptune descends to the main-deck, where he sits with his wife on a throne, close beside a large wash-deck tub, better than half-full of water. Those who have not crossed the Line before are now brought to the tub to be shaved; whether they will or no is no matter. Here, seated on a plank on the edge of the tub, the fresh hand has his face smeared over with tar, to remove which a piece of rusty hoop iron, jagged like a saw, is used as a razor; rather a rough method of shaving, you will say.

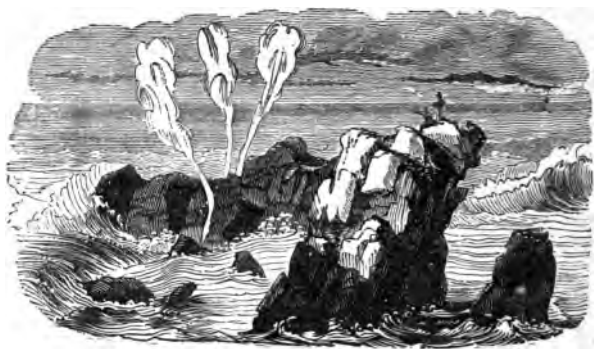
While the sailor is being shaved, he has questions put to him; but the moment he opens his mouth the tar-brush is poked into it, the plank is pulled away from under him, and he tumbles into the tub; out of which he scrambles the best way he can, and as he hurries away he is again attacked on all sides. Some souse him with buckets of water, or play the fire-engine full in his face, and others fling at him old swabs saturated with dirty water (mops made of bunches of old ropeyarn, generally used for cleaning the decks). But enough of this.

After passing the Cape, we made the Mauritius Islands in the Indian Ocean, to the east of Madagascar. Here, on the south side of the main island, is to be seen a remarkable rock, called the "Souffleur," from the following circumstance.

A large mass of rock runs out into the sea from the

main land, to which it is joined by a neck not two feet broad.

The constant beating of the tremendous swell which rolls in, has undermined this rock in every direction, till it has, in some parts, the appearance of a gothic building with a number of arches. In the centre of the rock, which is about thirty feet above the sea, the water has forced three passages vertically upwards, which are worn



as smooth and cylindrical as if they had been bored. When a sea roll in, it fills instantly the caverns under the rock, and, rushing up these chimneys, flies roaring up into the air to the height of sixty feet or more, as represented in the sketch. The moment the wave recedes, the wind rushes into the vacuum beneath with a loud humming noise, which may be heard at a considerable distance, from which circumstance it derives its name, "*The Souffleur, or Blower.*"

Continuing our voyage through the Indian Ocean, at length Adam's Peak, at Colombo, in the island of Ceylon, met our view. This peak or mountain is about 6,800 feet above the level of the sea. The appearance of sunrise from the top is beautiful beyond description.

Ceylon is famed for its pearl fishery. This fishery is commenced either in the month of March or April, when as many as 250 boats are engaged in it. The pearls are found in an oyster very similar to our own, except that they are rather more oval and much larger. They are found in beds of from two to ten miles in length, and from one to two miles broad, at a depth of from three to fifteen fathoms water.



PEARL FISHING.

The principal fishery is in the Gulf of Maraar, on the north-west coast of the island. One oyster will contain at times several pearls, sometimes nearly 100.

The oysters are obtained by men called divers, who commence their operations between seven and eight o'clock in the morning, and continue about six hours; two divers are appointed to each diving-rope, who relieve each other alternately. An expert diver will descend to the bottom, and, in the short space of one minute, if the

oysters lay thick, will collect about 150 in his basket. The diver then makes a signal by pulling the rope to which the basket is attached ; and it is immediately pulled to the surface by those in the boat, he himself coming up "hand over hand" by the diving-rope, reaching



the surface generally before the basket, where he swims about till his turn comes round to dive again. The annexed sketch is a representation of the scene.

When the boats return to land, the oysters are laid up in heaps in the sun on the sea-shore, and strictly guarded. After some days, when they are quite decomposed, the oysters and shells are separated and washed ; and, the pearls being all collected and sifted through sieves of various sizes, are then bored and strung, when they are taken to market and disposed of.

From Ceylon we now steered towards Madras. It was on a beautiful morning when, with a fine breeze, our noble ship was pursuing her way proudly across the Bay of Bengal.

The sun had risen in all its eastern splendour, and around us a shoal of dolphins were playing and leaping into the air, their burnished scales beaming and sparkling in the bright sunshine like brilliant gems.

The dolphin is about six or eight feet in length, but is not much esteemed as an article of food.

Many of the crew had prepared baits to attract them, whilst others stood with harpoons and spears, ready to strike the unwary fish as he approached the treacherous bait.

Not a cloud had been visible during the morning, and the ship was sailing easily under studding-sails, as were also the *Olympus* and the sloop-of-war.

For some time most of the crew were busily engaged either in catching or watching the beautiful changing hues of the dying dolphin; when suddenly the shrill sound of the boatswain's whistle rang along the decks, and "hands aloft—take in studding-sails," was shouted by the officer of the watch.

Before the order could be obeyed a most tremendous squall took the ship, laying her down completely on her beam-ends, and lashing the surface of the water into sheets of foam as white as milk. All was instant confusion, several men were washed off the deck, and many had narrow escapes. The helm was borne up "hard a-weather," but the ship's head would not "pay off." To "right her," we were at once obliged to cut away the mizen-mast, which fortunately answered the purpose; and, as the squall passed away almost as suddenly as it

arose, we were able to lie-to shortly after and repair damages.

Not so fortunate, however, was the case of the *Olympus*, for the squall caught her as unprepared as ourselves, and they lost both their main and mizen-masts before they could get her upon her legs again.

The *Zephyr* happily escaped with but slight damage to her upper rigging. Having rigged up jury-masts on board our ship, and also in the *Olympus*, we once more bore up on our course towards Madras, where we could have our damages thoroughly repaired.

A few days after these occurrences we arrived at Madras. Madras is one of the principal towns, or British



residences, in Hindostan, on the Coromandel coast. On this coast, for about two miles out, is such a tremendous surf, that no European boats ever venture to land through it. Ships coming to Madras always lie off

(outside the range of the surf); and the passengers and crews are taken off and brought on shore in native boats, called Massulah boats.

From Madras our little squadron proceeded into the China Seas. Here we fell in with some Chinese junks, very remarkable vessels, both as to build and rig. They



CHINESE SALT BOAT.



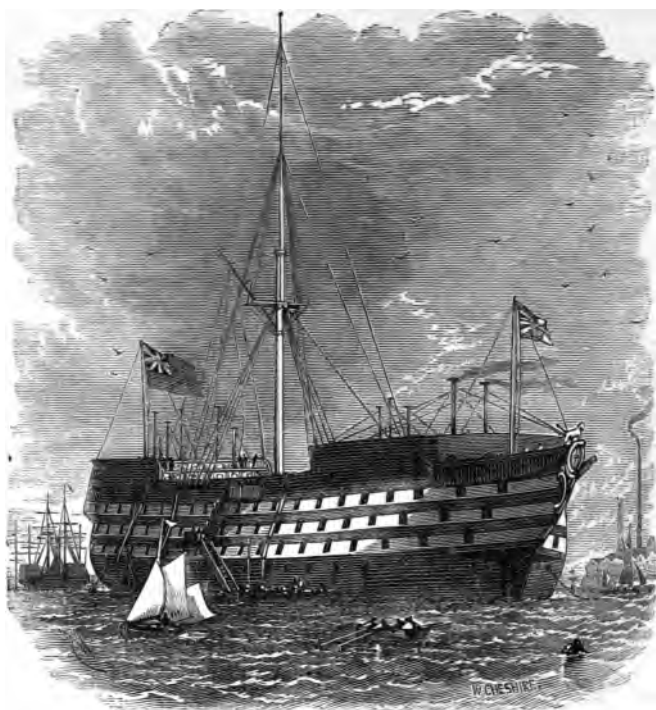
are of very light materials, but, from their buoyancy, run very fast before the wind, and are rarely lost. They are of all sizes, up to 700 or 800 tons burthen.



While cruising in the North Pacific Ocean, we frequently fell in with the Indian *proas*. These boats more particularly belong to the Marian, or Ladrone, Islands; so called by the Spaniards, from the thievish character of the natives—the word “ladrone” meaning “robber.”

The Indian *proa* is built head and stern alike, so that by simply shifting the sail, they sail backwards or forwards, without “going about” (turning round).





CHAPTER XXIII.

The *Prince of Wales* returns to England—Madeira—Eddystone lighthouse—Plymouth Sound—Breakwater—Section of stone-vessel—Dockyard—Hamoaze—Victualing-yard—The guard-ship—Sold out of the service to be broken up—Her end.

I HAVE now taken you through some of the scenes of my not uneventful life on the ocean, and I draw near our parting. This, therefore, is what I term a melancholy chapter, for I have to speak of the end of the good old

ship. But I must not leave her in the China Seas, for in so doing I should not fulfil the promise contained in the title of this work, which was to be "The History of a Ship from her Cradle to her Grave."

I must, therefore, bring the *Prince of Wales* home to dear Old England again, and tell you what became of her afterwards.

Although I have only described to you some eight or ten years of her existence, in which I had the opportunity of noting the facts contained in these pages, it is necessary for me to inform you that she had been to sea many times before, and though not a new ship at the time I first sailed in her, was not an old one, and therefore capable of rendering service to her country for many years to come.

In bringing the *Prince of Wales* home, I shall not make any remarks on those places at which we touched in coming from the East Indies. You will, therefore, suppose her to have re-passed the Cape of Good Hope, got through the South Atlantic Ocean, and reached the island of Madeira on the north-west coast of Africa, on her homeward-bound voyage. This island is constantly visited by ships, although they do not always anchor here.

Madeira is a beautiful and fertile island, and its climate is so regular that for twenty years it was found to vary only from about sixty-four to seventy-six degrees; it is, in consequence, much resorted to by invalids. The capital town is called Funchal.

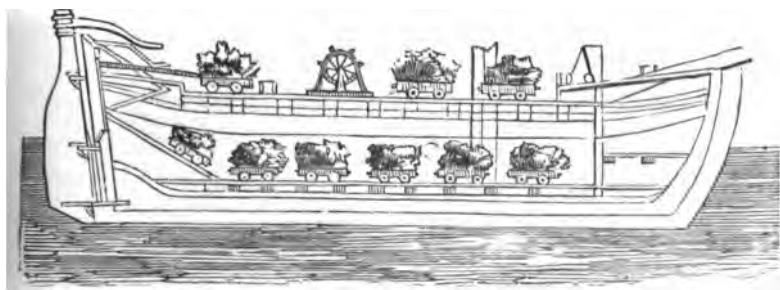
Having weighed and set sail from Madeira, we proceeded on our course towards England, and in due time got into the English Channel. Every man in the ship was rejoiced at the cry of "land." And when the Eddystone Light-



house (built on a rock at the entrance of the harbour of Plymouth) was in sight, there was scarcely a man that did not come up on deck to have a view of it.

The harbour of Plymouth, called Plymouth Sound, is now a very secure one. Its security is derived from a breakwater or artificial mole, constructed across the middle of the Sound or bay. This breakwater is about a mile in

length, and on the top is 45 feet wide, but the base extends to a width of 500 feet. It is constructed of loose blocks of stone thrown at first promiscuously into the sea along the whole length of the work, averaging about five fathoms in depth at low water. When raised above this level (low water) the surface is finished with squared blocks of stone, fitting close and producing an even surface for walking on. Upon it, at the centre, is a flagstaff, and along its inner or land face are several landing-places, with steps.



To carry out the immense blocks of stone (from 8 to 10 tons weight) used in the construction of this great work, a particular kind of vessel was built, with railings along her deck and at the bottom of the hold. Their sterns were made to open with large ports or doors, so that a truck might be drawn on with the stone upon it by the machinery on deck. When the vessels arrived at the spot for depositing their cargoes, the trucks were drawn back in succession to the port-hole at the stern, and the stone tilted off into the water to find its own bed. The longi-

tudinal section of the stone-vessel will show the arrangement of the loaded trucks on board.

In the view of Plymouth Sound the situation of the breakwater is denoted by a line drawn across the middle of the bay. At Plymouth there is a large dockyard, and the arm of the sea facing it, which extends several miles inland, is called the Hamoaze, where the ships in ordinary lie until required for service.



The range of large buildings on the left, in the above sketch, is the Victualling-yard, where biscuit, salt provisions, water-tanks, men's clothing, and other stores for victualling the navy are obtained. The arm of the sea, on the right, leads to the Dockyard and the Hamoaze; and that on the left, to Plymouth and the Cutwater, where merchant-ships anchor.

And now, my young readers, I must tell you, that events similar to those contained in the foregoing pages occurred in all the subsequent voyages of the *Prince of*

Wales ; that is, she was refitted—re-commissioned—dispatched to cruise on different stations—met with storms and calms—fell in with the enemies of her country—fought and conquered—and returned to England.

But time and ill usage (for she had many hard knocks when attacking and defending herself against her enemies) was beginning to tell upon her constitution ; every succeeding refit became more expensive, inasmuch as there was more to be done—more old splintered and worn-out planks to be removed, and new ones substituted ; till it at length became rather doubtful to say whether the good old ship had one piece of timber remaining that belonged to her when she was launched. If she possessed any, there were but few who could point them out ; for she had had a long life, and outlived most of those who had both ordered her to be built, and were engaged in her construction.

At one time she was lying up in ordinary in Chatham River (where there is also a dockyard), and then her case was under consideration at the Admiralty, as to whether she should be again repaired, and fitted for sea, or sold to be broken up. I cannot deny to you, my young readers, that I felt sorely grieved on gaining this intelligence ; for she was an old friend of mine, and I had the honour of commanding her, too, in one of her later voyages. I tried hard to get a little respite for my old favourite. However, her fate was not decided at this time : it was represented that, though not in a fit state for active ser-

vice, she might do very well, for three or four years, as guard-ship; and as "Guardo" she was consequently fitted, and moved down to Portsmouth.

The four years expired, the consideration of her case again came on, and her fate being decided, she was sold out of the service to be broken up.



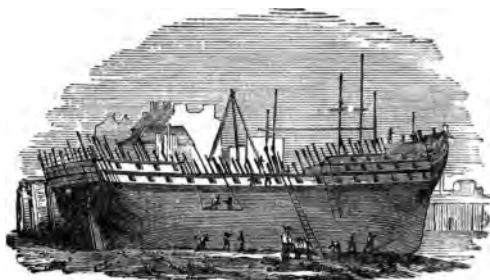
SHIP-YARD.

A kind of pang shot through my heart when I heard of it; and I could not resist the inclination to go and see her once more, before she was entirely demolished. I therefore set off for Portsmouth, and, arriving at the ship-broker's yard, I found her hauled up on dry ground, with scaffolding poles and ladders ranged round her sides, while in heaps about the yard lay the planks and ribs that had already been stripped off.

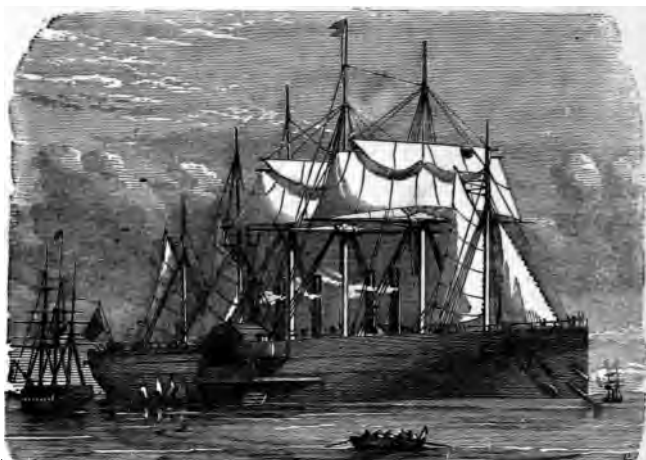
It was a grievous sight to me, and yet I could not refrain from looking at her whilst plank after plank was removed. At length I could bear it no longer—I could

not stay to witness the destruction of my old acquaintance; and, in turning to leave the spot, I uttered, "Farewell! *Prince of Wales!* Farewell, thou good old ship!"

Thus, my young readers, closed the existence and the successes of this noble ship; for, in a short time, nothing but her skeleton remained, which, in due time, was consigned to its



GRAVE.

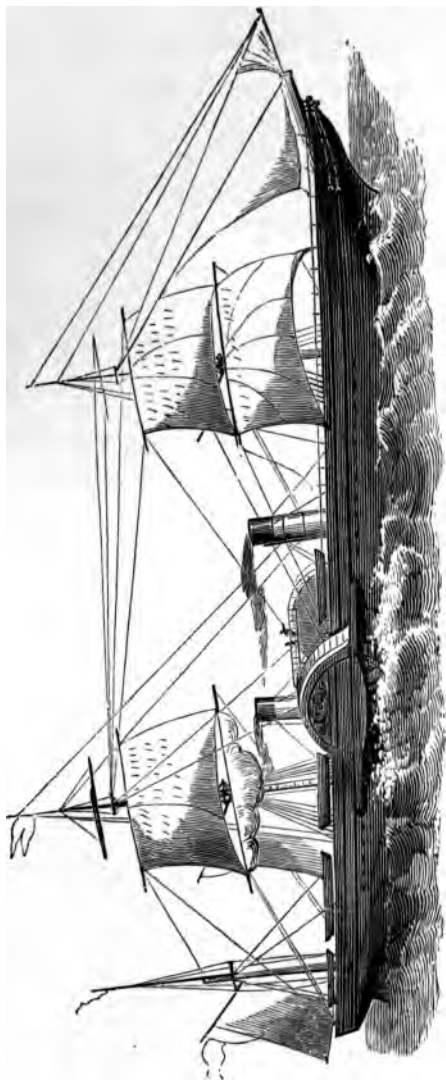


A SHORT ACCOUNT OF STEAM-SHIPS,
AND OF THEIR INTRODUCTION INTO THE
MERCANTILE MARINE AND THE ROYAL NAVY.

CHAPTER XXIV.

Papa promises information about the steam-engine—James Watt's invention—Application of steam to ships—The Marquis de Jouffrey—Rumsey and Fitch—The *Charlotte Dundas*—The *Comet*—The steam-tug—Paddle-wheels—The Screw-propeller—Captain Ericsson's invention—Progress—The *Great Eastern*.

As Grandpa has given you so long an account of the sailing-ships of his day, I should think you would be glad to learn something of the steam-ships which now traverse the ocean in every direction, and are so numerous in all navigable rivers; I will, therefore, tell you something about them.



MERCHANT STEAM-SHIP (PADDLE).



As you may suppose, it has been the work of many minds and many years to bring marine engines to their present almost perfect state, and to prove this I have only to tell you that the first written account of a machine in which heat is made to perform work by means of steam, states that such a machine was made by Hero of Alexandria, who lived 150 years before the birth of our Saviour, or more than 2,000 years ago.

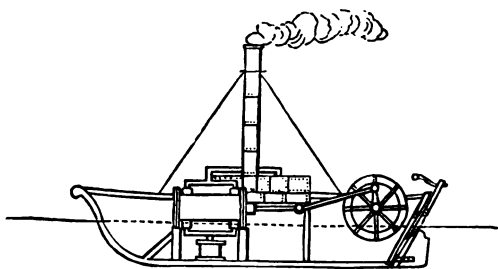
After this time not much is recorded of the steam-engine, but from the year 1,600 we have from time to time accounts of steam-engines until 1663, when the Marquis of Worcester described a machine for raising water by means of steam, which he had constructed some years previously. In 1697 Savory constructed an engine in which a separate boiler was the special improvement. Then came Denis Papin, who invented the cylinder and piston. Afterwards we have several other scientific inventors, until we come to the time of James Watt, who for a number of years carried on a series of experiments, making one improvement after another, solving first this difficulty and then that, until he produced a working engine; the principle of which was adopted by all other makers, with such alterations and improvements as were suited to the locality of the engine and the work it had to perform.

The following condensed history of the application of steam to the propulsion of ships is given that you may form some idea of the industry, ability, and perseverance of the men who have brought about the result we now

see. In 1698 Denis Papin was present at the trial of a boat propelled by a machine contrived by Savory (one of the inventors before alluded to), in which paddle-wheels were driven by a water-wheel, which water-wheel was driven by water raised by means of the steam-engine. In 1736 a steam-vessel was invented by Jonathan Hulls, in which paddle-wheels were driven by ratchet-work, that is, a series of toothed wheels, acted upon by chains or ropes attached to the piston of a steam-engine.

In 1781 the Marquis de Jouffrey had a steam-vessel upon the Rhone, in which the paddle-wheels were driven by chains connected with the engine; and in 1785 he constructed another in which the paddle-wheels were driven by rack-work.

In 1784 Rumsey and Fitch constructed a steam-vessel in America, as did Miller of Dalswinton in 1788-9; but all these failed chiefly because of the imperfect means of communicating the power of the engine to the propeller.



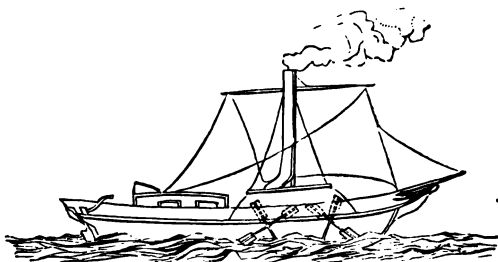
THE "CHARLOTTE DUNDAS."

By the inventions of James Watt, however, the transmission of power smoothly and without shock or jar was

effected, the way to success in steam navigation being thus paved; and "the first practicable steamboat," the *Charlotte Dundas*, was built in 1801, and successfully employed as a tug-boat on the Forth and Clyde Canal.

After this Fulton began his experiments in America, and in 1807 his vessel, the *Clermont*, was propelled by paddles driven by an engine made by Boulton and Watt in England; but in 1804 Stevens ran a steamer between New York and Hoboken with a "screw propeller" driven by one of Watt's engines.

In 1812 Bell of Glasgow had the *Comet* steamer on the Clyde; she was propelled by two pairs of paddles, also driven by one of Boulton and Watt's engines.



THE "COMET."

From these small beginnings have arisen the splendid steamships which are now in use on every ocean and navigable river almost throughout the world.

As has been shown, the first steam-vessels were intended to navigate canals and narrow and intricate rivers, where an ordinary sailing-vessel could not, without extreme labour and difficulty, make a passage, because she

could not exert the full power of her sails ; and the only other method of progression was that of towing by horses on canals or by boats on rivers—which was rendered very tedious work when, as is frequently the case in rivers, a very strong current has to be overcome. The steam-vessel at once removed this obstacle to commerce; and after some experience it was found that she could not only force her own way up a river, where a strong current opposed her, but that she could drag after her one or two trading-vessels, as large as herself, even against wind and tide.

This fact caused the introduction of the steam-tug; which is strongly built, and fitted with an engine of



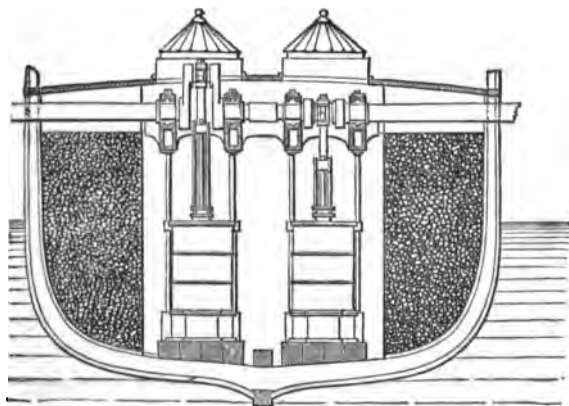
TUG.

sufficient power for the work of towing large vessels up and down narrow rivers, where a difficulty of using sails exists. The tug sometimes goes ahead of the vessel, and at others is lashed alongside, according to circumstances.

It was the opinion of many eminent men that

it would be impossible to run steamers on long sea-voyages with safety and profit, not only on account of the cost, but of the quantity of coals to be carried, which they supposed would occupy the space of the vessel, leav-

ing no room for cargo; but this opinion was shown to be wrong, for in 1838 the *Great Western* steamer crossed the Atlantic safely and speedily, and since then ocean-going steamers have become very numerous, and the passages to and from distant countries are not only effected with speed and safety, but with so much certainty that the time of their arrival at their destination can be calculated to a day. This is especially so as regards the splendid mail-steamers: they are sound, staunch vessels, well found in every particular, and well manned—that is, with a sufficient number of engineers, stokers, and sailors, and commanded by high-class men.



SECTION OF A MARINE ENGINE.

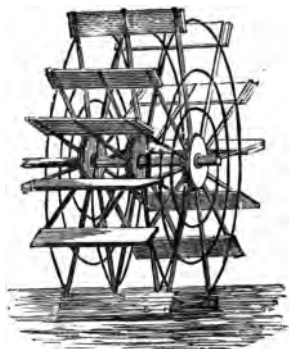
It is not necessary to give an elaborate description of the steam-engine; it will be sufficient for my readers to know that it is a machine to which motion is given by

heating water contained in large boilers placed over a very strong fire, until driven off in vapour, or steam. The steam is made to pass through a tube into a certain part of the machine called the cylinder, where, by the force of its pressure, it gives motion to a piston ; and the constant supply of steam from the boilers keeps up the motion thus obtained. Steam-engines are of various sizes, from one to 1,500-horse power ; that is, they are capable of exerting continuously an amount of power equal to the strength that number of horses would be calculated to possess in action. But this mode of speaking of the power of an engine by no means gives an idea of its vast strength and force, as it is not uncommon to find one working up to a power very much greater than its nominal ability.

The active strength thus obtained has to be brought into useful contact with the water ; and many have been the contrivances how to do this in such a way that the most speed should be obtained by the exercise of any given amount of force in the engine ; and in the early history of steam navigation, trials were made of an apparatus that should act like a bird's webbed foot, expanding on striking the water, and contracting as it was drawn back after its force was expended. Another scheme was to draw water in at the bows and force it out at the stern, or at both sides. The fans of a windmill suggested to another inventor a possible success by applying something similar to act under water ; yet, although so near to what is now known as the screw-propeller, this idea

shared the fate of the other two, and was forgotten in the success of the paddle-wheels.

These, which for many years after the introduction of steam navigation were the indispensable appendages of a vessel propelled by steam, are two large wheels, around which are fixed a number of flat boards on edge, as shown in the drawing, which, as the wheel is moved round by the action of the engine, act on the same principle as paddles or oars used in propelling a boat, that is, they push against the water during the time they are in it; and, speaking generally, the more quickly the wheels revolve, the greater is the speed of the vessel.

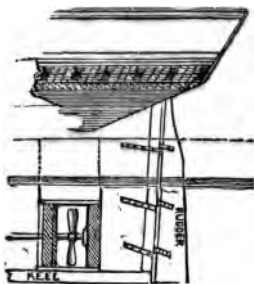


In one of the earliest attempts to propel a vessel by steam, the paddle-wheel was hung over the stern, upon and between two projecting poles, and although the difficulties attendant on such an arrangement were soon found so great that succeeding experimentalists removed their engine to the centre, and placed a wheel on each side, there was in this early trial a sort of foreshadowing of the success which should attend propulsion at the stern by the screw.

Paddle-wheels were well suited to river navigation, where the wheel could constantly dip its given distance into the water; but it is evident that at sea, in heavy

weather, when the ship was rolling, one wheel would be buried in the water, and that on the opposite side whirling in the air, so that one would be overworked, the other doing nothing, and considerable strain and risk caused to the engine.

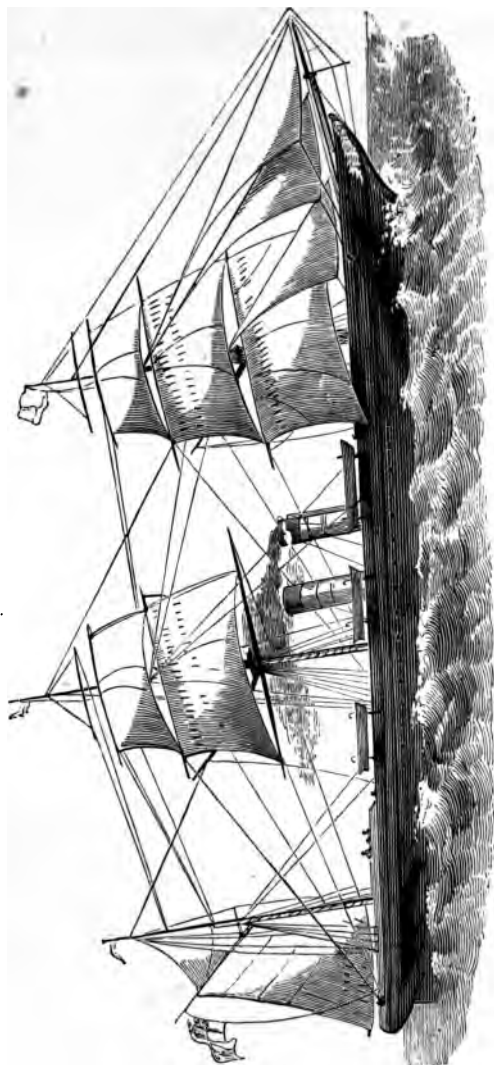
In vessels of war, steam, as a motive power, was obviously invaluable, enabling any necessary manœuvre to be executed with nicety ; but so long as paddle-wheels



were the agents, it was impossible fully to adopt it ; huge objects, exposed to every shot, they would but take their owner into action to place him helplessly at the mercy of his first opponent. Against this the screw provides: snug down in what the seaman calls the dead wood, it works noiselessly, out of sight, and out

of reach of damage by shot, and leaves the entire deck free for working the guns and the active duties of the sailor. The greatest danger it is subject to is fouling by seaweeds, ropes, and wreck ; but, doubtless, even at some slight sacrifice of speed, if necessary, this will be, by-and-bye, generally guarded against.

It is difficult to give a sketch that will convey a correct idea of the screw in general use ; but you will obtain it if you will cut out a piece of card exactly this shape, stick the round piece against the flat end of a pencil, **then** twist the two blades (both in the same direction) just



MERCHANT STEAM-SHIP (SCREW).



so much that, as you look at them sideways, they show not more than half their real width. The pencil now represents the shaft which runs along in a line with the keel,



but above it ; and as it is turned round you will see the screw-propeller in full action.

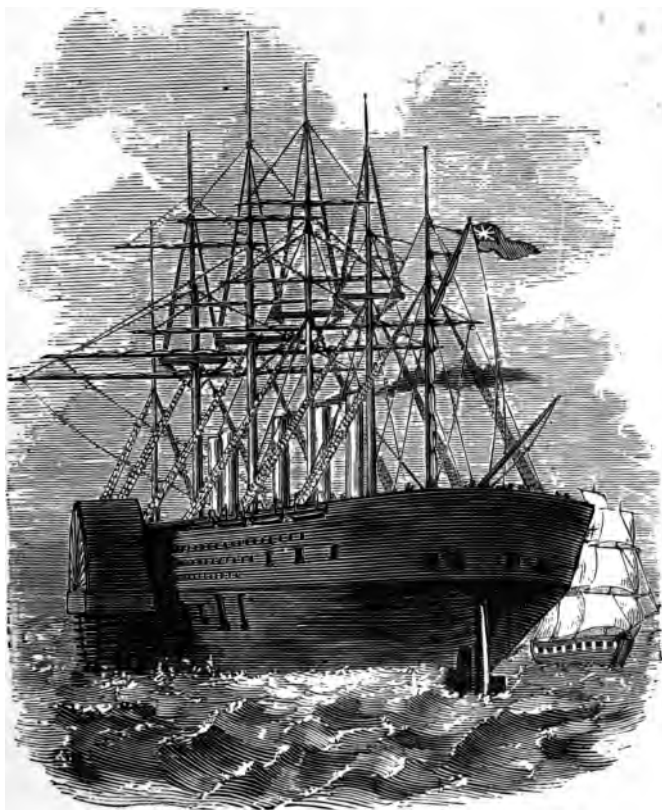
As is usually the fate of inventions in this country, the screw was not readily adopted even when its importance had been proved. It is generally understood that a practical mechanic named Shorter succeeded in propelling a vessel by a screw in 1802, but at that time no power was available for driving it with proper effect. When Watt's steam-engine was introduced, the paddle-wheel was adopted, and its success seems to have put the screw out of mind for a time ; but Captain Ericsson and Mr. F. P. Smith brought out their experimental vessels in 1837, and on the 25th of May in that year, the former gentleman's small boat, 45 feet in length, and 8 feet beam, drawing only 2 feet 3 inches of water, towed the American ship *Toronto*, of 630 tons burthen, in the Thames against tide at a speed of $4\frac{1}{2}$ knots per hour.

Captain Ericsson informed the Lords of the Admiralty of the success of his experiment, and pointed out the many advantages of the screw-propeller for vessels of war ; but after repeated applications and long suspense,

he was informed that their Lordships declined to entertain the project. The screw, however, forced its way into public estimation, and in 1840 the Lords of the Admiralty ordered the *Rattler* to be built, and her success was so undoubted, notwithstanding an error in the construction of her hull, that other ships were ordered, and the screw became established as the best propeller for all ocean steamers, whether mercantile or those of the Royal Navy.

I wish you to contrast with the diagrams of the *Comet* and the *Charlotte Dundas*, on pages 292 and 293, the drawing and description of the *Great Eastern* steamship, the largest ship afloat. The following remarks on this and other large steamships are taken from Mr. Routledge's valuable work, "Discoveries and Inventions of the Nineteenth Century."

A great impulse was given to steam navigation by the substitution of iron for wood in the construction of ships. The weight of an iron ship is only two-thirds that of a wooden ship of the same size. It must be remembered that though iron is many times heavier than wood, bulk for bulk, the required strength is obtained by a much less quantity of the former. A young reader might, perhaps, think that a wooden ship must float better than an iron one, but the law of floating bodies is that the part of the floating body which is below the level of the water takes up the space of exactly so much water as would have the same weight as the floating body, or in fewer words, a floating body displaces its own *weight* of water. Thus we

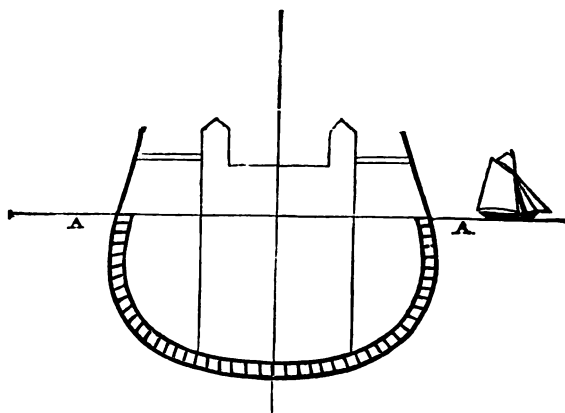


"THE GREAT EASTERN."



see that an iron ship, being lighter than a wooden one, must have more buoyancy. The use of iron in ship-building was strenuously advocated by the late Sir W. Fairbairn, and his practical knowledge of the material gave great authority to his opinion. He pointed out that the strains to which ships are exposed are of such a nature that vessels should be made on much the same principles as the built-up iron beams or girders of railway bridges. How successfully these principles have been applied will be noticed in the case of the *Great Eastern*. This ship, by far the largest vessel ever built, was designed by Mr. Brunel, and was intended to carry mails and passengers to India by the long sea route. The expectations of the promoters were disappointed in regard to the speed of the vessel, which did not exceed 15 miles an hour; and no sooner had she gone to sea than she met with a series of accidents, which appear, for a time, to have destroyed public confidence in the vessel as a sea-going passenger ship. Some damage and much consternation were produced on board by the explosion of a steam jacket a few days after the launch. Then the huge ship encountered a strong gale in Holyhead Harbour, and afterwards was disabled by a hurricane in the Atlantic, in which her rudder and paddles were so damaged that she rolled about for several days at the mercy of the waves. At New York she ran upon a rock, and the outer iron plates were stripped off the bottom of the ship for a length of 80 feet. She was repaired and came home safely, but the companies which owned her found themselves in financial difficulties,

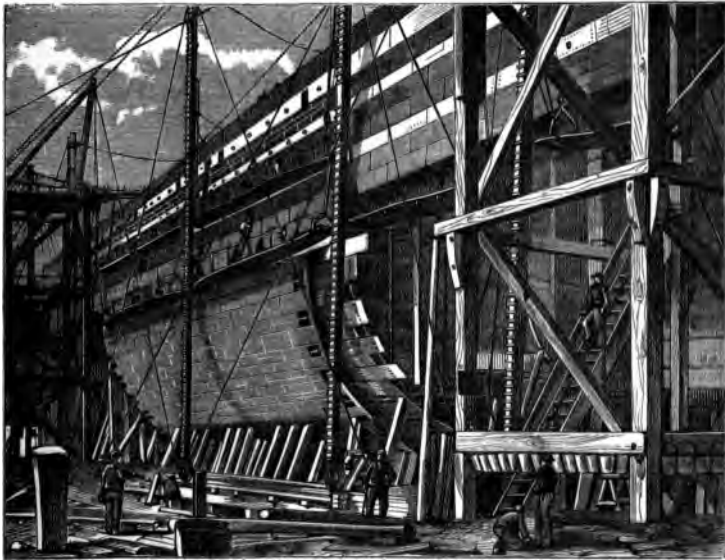
and the big ship, which had cost half a million sterling, was sold for only £25,000, or only about one-third of her value as old materials.



SECTION OF "GREAT EASTERN" AMIDSHIPS.

The accidents which had happened to the ship had **not**, however, materially damaged either the hull or the **machinery**; and the *Great Eastern* was refitted, and afterwards employed in a service for which she had not been **designed**, but which no other vessel could have attempted. This was the work of carrying and laying the whole length of the Atlantic Telegraph Cable of 1865, of which 2,600 miles were shipped on board in enormous tanks, that with the contents weighed upwards of 5,000 tons. The ship has since been constantly engaged in similar operations. The *Great Eastern* is six times the size of our largest **line-of-battle** ships, and about seven times as large as the

splendid steamers of the Cunard line, which run between Liverpool and New York. She has three times the steam power of the largest of these Atlantic steamers, and could carry twenty times as many passengers, with coal for 40



THE "GREAT EASTERN" IN COURSE OF CONSTRUCTION.

days' consumption instead of 15. Her length is 692 feet ; width, 83 feet ; depth, 60 feet ; tonnage, 24,000 tons ; draught of water when unloaded, 20 feet ; when loaded, 30 feet ; and a promenade round her decks would be a walk of more than a quarter of a mile. The vessel is built on the cellular plan to 3 feet above the water-line—that

is, there is an inner and an outer hull, each of iron plates $\frac{3}{4}$ inch thick, placed 2 feet 10 inches apart, with ribs every 6 feet, and united by transverse plates, so that in place of the ribs of wooden ships, the hull is, as it were, built up of curved cellular beams of wrought iron. The ship is



THE "GREAT EASTERN" READY FOR LAUNCHING.

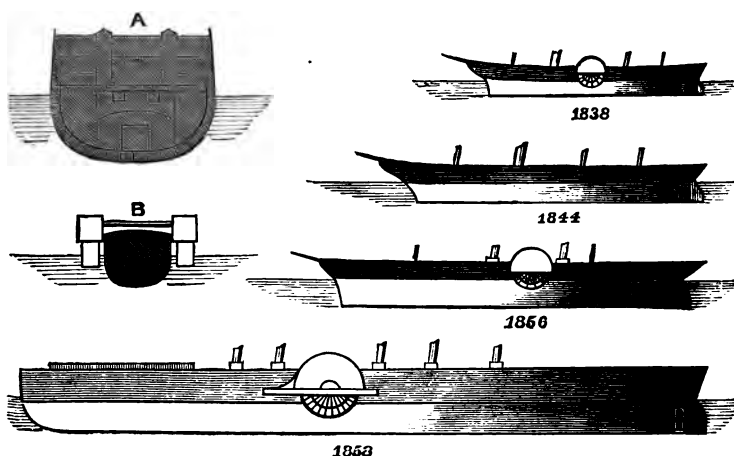
divided longitudinally by two vertical partitions or bulkheads of wrought iron $\frac{1}{2}$ inch thick. These are 350 feet long and 60 feet high, and are crossed at intervals by transverse bulkheads in such a manner that the ship is divided into nineteen compartments, of which twelve are completely water-tight, and the rest nearly so. The dia-

gram represents a transverse section, and shows the cellular construction below the water-line. The strength and safety of the vessel are thus amply provided for. The latter quality was proved in the accident to the ship at New York ; and the former was shown at the launch, for when the vessel stuck, and for two months could not be moved, it was found that although one-quarter of the ship's length was unsupported, it exhibited no deflection, or, rather, the amount of deflection was imperceptible. The illustration is from a photograph taken during the building of the ship, and the next cut shows the hull when completed and nearly ready for launching, while the vignette at the head of the chapter exhibits the big ship at anchor when completely equipped. The paddle-wheels are 56 feet in diameter, and are turned by four steam-engines, each having a cylinder 6 feet 2 inches in diameter, and 14 feet in length. The vessel is also provided with a four-bladed screw-propeller of 24 feet diameter, driven by another engine having four cylinders, six boilers, and seventy-two furnaces. The total actual power of the engines is more than that of 8,000 horses, and the vessel could carry coals enough to take her round the world, a capability which was the object of her enormous size. The vessel as originally constructed contained accommodation for 800 first-class passengers, 2,000 second-class, and 1,200 third-class—that is, for 4,000 passengers in all. The principal saloon was 100 feet long, 36 feet wide, and 13 feet high. Each of her ten boilers weighs 50 tons, and when all are in action 12 tons of coal are burnt every hour,

and the total displacement of the vessel laden with coal is more than 20,000 tons.

The use of steam power in navigation has increased at an amazing rate. Between 1850 and 1860 the tonnage of the steam shipping entering the port of London increased threefold, and every reader knows that there are many fleets of fine steamers plying to ports of the United Kingdom. There are, for example, the splendid Atlantic steamers, some of which almost daily enter or leave Liverpool, and the well-appointed ships belonging to the Peninsular and Oriental Company. The steamers on the Holyhead and Kingston line may be taken as good examples of first-class passenger-ships. These are paddle-wheel boats, and are constructed entirely of iron, with the exception of the deck and cabin fittings. Taking one of these as a type of the rest, we may note the following particulars: the vessel is 334 feet long, the diameter of the paddle-wheels is 31 feet, and each has fourteen floats, which are 12 ft. long and 4 ft. 4 in. wide. The cylinders of the engines are 8 ft. 2 in. in diameter, and 6 ft. 6 in. long. The ship cost about £75,000. The average passage between the two ports—a distance of $65\frac{1}{2}$ miles—occupies 3 hours 52 minutes, and at the measured mile the vessel attained the speed of nearly 21 miles per hour. As an example of the magnificent vessels owned by the Cunard Company, we shall give now a few figures relating to one of their largest steam-ships, the *Persia*, launched in 1858, and built by Mr. N. Napier, of Glasgow, for the company, to carry mails and passengers between Liverpool and

New York. Her length is 389 ft., and her breadth 45 ft. She is a paddle-wheel steamer, with engines of 850 horse-power, having cylinders 100 in. in diameter, with a stroke of 10 ft. The paddle-wheels are 38 ft. 6 in. in diameter, and each has twenty-eight floats, 10 ft. 8 in. long and 2 ft. wide. The *Persia* carries 1,200 tons of coal, and displaces about 5,400 tons of water.



COMPARATIVE SIZES OF STEAMSHIPS.

1838, *Great Western*; 1844, *Great Britain*; 1856, *Persia*; 1858, *Great Eastern*. A, Section amidships of *Great Eastern*; B, The same of *Great Western*. Both on the same scale, but on a larger one than their profiles.

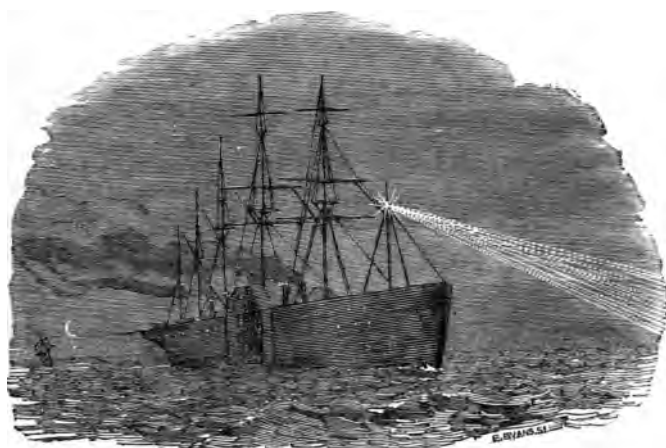
A velocity of twenty-one miles per hour appears to be about the highest ever attained by a steamer. This is probably near the limit beyond which the speed cannot be increased to any useful purpose. The resistance offered by water to a vessel moving through it increases more rapidly than the velocity. Thus, if a vessel were made to

move through the water by being pulled with a rope, there would be a certain strain upon the rope when the vessel was dragged, say, at the rate of 5 miles an hour. If we desired the vessel to move at double the speed, the strain on the rope must be increased fourfold. To increase the velocity to 15 miles per hour, we should have to pull the vessel with nine times the original force. This is expressed by saying that the resistance varies as the square of the velocity. Hence, to double the speed, the impelling force must be quadrupled, and as that force is exerted through twice the distance in the same time, an engine would be required of eight times the power—or, in other words, the power of the engine must be increased in proportion to the *cube* of the velocity; so that to propel a boat at the rate of 15 miles an hour would require engines twenty-seven times more powerful than those which would suffice to propel it at the rate of 5 miles an hour.

The actual speed attained by steam-ships with engines of a given power and a given section amidships will depend greatly upon the shape of the vessel. When the bow is sharp, the water displaced is more gradually and slowly moved aside, and therefore does not offer nearly so much resistance as in the opposite case; but the greater part of the power required to urge the vessel forward is employed in overcoming a resistance which in some degree resembles friction between the bottom of the vessel and the water.

The wonderful progress which has, in a comparatively short time, taken place in the power and size of steam-vessels, cannot be better brought home to the reader than

by a glance at the cut which gives the profiles of four steamships, drawn on one and the same scale, thus showing the relative lengths and depths of those vessels, each of which was the largest ship afloat at the date which is



THE "GREAT EASTERN" AT NIGHT.

marked below it, the whole period including only the brief space of twenty years!—for this, surely, is a brief space in the history of such an art as navigation. All these ships have been named in the course of this article, but in the following table a few particulars concerning each are brought together for the sake of comparing the figures:—

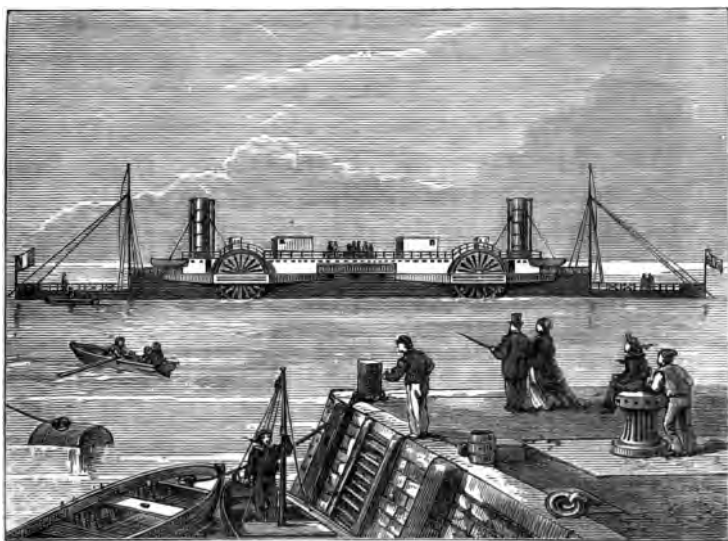
Date.	Name.	Propulsion.	Length.	Breadth.
1838	<i>Great Western</i> ...	Paddles	236 ft.	36 ft.
1844	<i>Great Britain</i> ...	Screw	322 "	51 "
1856	<i>Persia</i>	Paddles	390 "	45 "
1858	<i>Great Eastern</i> ...	Screw and paddles ...	690 "	83 "

I append, also from "Discoveries and Inventions of the Nineteenth Century," a description of two remarkable vessels which excited great interest at the time this account was written, but which did not quite bear out the anticipations of the inventors. I believe, however, that the same principles have since been more successfully applied :—

THE BESSEMER CHANNEL STEAMER.

The latest, most novel, and most ingenious invention connected with steam navigation is certainly the steamer which Mr. Bessemer has built at Hull. This invention will entirely abolish all the unpleasant sensations which landsmen are apt to experience in a sea voyage. The problem of effectually removing the cause of the distressing *mal de mer* now appears likely to be successfully solved. Mr. Bessemer's ship is built for plying between the shores of France and England, and the method in which he purposes to carry passengers over the restless sea which separates us from our Gallic neighbours is bold and ingenious in the highest degree. He will carry the passengers in a spacious saloon, which, instead of partaking of the rolling and tossing of the ship, will be maintained in an absolutely level position. The saloon will be suspended on pivots, much in the same way as a mariner's compass is suspended ; and, by an application of hydraulic power, forces will be applied to counteract the motion of the ship and maintain the swinging saloon

perfectly horizontal. It was originally intended that the movements should be regulated by a man stationed for that purpose, where he may work the levers that bring the machinery into action, so as to preserve the saloon in the required position. This plan has, however, been



THE BESSEMER STEAMER.

improved upon, and the adjustments will be automatic. It may be well to mention that it is a mistake to suppose that anything freely suspended, like a pendulum, on board a ship rolling with the waves, will hang vertically. If, however, we cause a heavy disc to spin very rapidly, say in a horizontal plane, the disc cannot be moved out of

the horizontal plane without the application of some force. A very well-made disc may be made to rotate for hours, and would, by preserving its original plane of rotation, even show the effect of the earth's diurnal motion. Mr. Bessemer makes use of such a gyroscope to move the valves of his hydraulic apparatus, and so to keep his swinging saloon as persistently horizontal as the gyroscope itself. The following interesting details regarding Mr. Bessemer's latest invention are extracted from the *Daily Telegraph* of the 23rd September, 1874:—

“At the water-line Mr. Bessemer's ship is 350 feet long, and each end, for a distance of 48 feet, will be only about 4 feet from the line of floating. In rough weather the water will wash over the ends, which have been rounded, so as to throw it off as easily as possible. These cigar-shaped extremities are fitted with capstans, worked by Messrs. Brown's (Edinburgh) hydraulic apparatus, and the vessel is provided with two of Martin's patent anchors. When at sea there will seldom be any necessity for any one to go upon the ends, but they will be used chiefly when the vessel is entering a harbour or port. Above the low ends a breastwork is raised, about 8 feet high, 254 feet long, and extending the entire length of the vessel. In the centre, and occupying the space of 90 feet, is the swinging saloon, which is intended for first-class passengers. At either end of this apartment are the engines and boilers; on the breastwork deck are deck-houses, for private families or parties, smoke-rooms, refreshment bars, &c. Although both ex-

tremities of the vessel have the same appearance, each being fitted with a rudder sheeted by Messrs. Brown's hydraulic machinery, they may for convenience be named the fore and after ends. As the latter will be the part first to take the water at the launching, temporary bulwarks are being erected, so that as little wash as possible may be caused. At the after-part of the vessel, and entirely independent of the swinging saloon, is the accommodation for second-class passengers. On the first floor is a spacious cabin for ladies, and two other cabins, which can be used by familiès or other persons requiring privacy. On the next floor is the second-class saloon, 51 feet in length. The entrances to the engine-rooms are of a convenient character, and there is every probability that in fine weather this part of the vessel will be frequently resorted to by passengers. Running in all directions in the engine-room are huge pipes, conveying steam to different engines, and water to the numerous pumps situated in various parts of the vessel.

"The engines are oscillating and expansive, working up to 4,600 horse-power, which, should it be required, can be increased to as much as 5,000 ; but it is expected that the former will be quite sufficient to drive the ship at the required speed of twenty miles per hour. There are two pairs of engines, one set at either end of the ship, and each having two cylinders of 80 inches in diameter, and a stroke of 5 feet, working with steam of 30 lbs. pressure per square inch, supplied from four box-shaped boilers, each boiler having four large furnaces.

The paddle-wheels, of which there are a pair on either side of the vessel, are 27 feet 10 inches in diameter outside the outer ring, and each wheel has twelve feathering floats. It is expected the leading pair of wheels, when working at full speed, will make thirty-two revolutions per minute. The following pair of wheels will of course move faster, as they will receive some of the wash from the leading ones. Every care has been taken to so secure the engines in their places that when developing their enormous power they shall not strain or injure the ship. For starting, stopping, and reversing the engines, Brown's hydraulic starting-gear has been adopted. All orders to the engineers will be conveyed from the bridges to the engine-room by telegraph. The whole of the levers for working an engine are brought within a space of three feet, so that the engineer, without moving from the spot, can reach any one of them. Great care has been taken to make the gear as simple as possible, so that one engineer only will be required to actually work the engines, and either can be started and reversed in a few seconds. The levers, in fact, are so easily worked that a child could set the engines in motion or stop them. There will be no necessity for the stokers ever to appear on deck. Those engaged in stoking for the after engine can walk along a passage which brings them to the fore engine, near which their bunks are situated. This passage will also enable the engineers to get at once from one engine-room to the other, in case anything should be the matter with the machinery

"Entrance to the Bessemer saloon is gained by two broad staircases leading to one landing, and a flexible passage from this point to the saloon will be laid. The saloon rests on four steel gudgeons, one at each end, and two close together near the middle. These are not only employed to support the saloon, but are also utilized for conveying the water to the hydraulic engines, by which the saloon is kept steady. For this purpose the after one has been made hollow, and is connected with the water-mains from two pairs of powerful engines made by Messrs Galloway and Co., Manchester, and also with a supply-pipe leading to a central valve-box, by means of which the two hydraulic cylinders on either side are supplied with water. Between the two middle gudgeons is placed a gyroscope, worked by a small turbine, filled with water from one of the gudgeons. The introduction of this gyroscope has enabled Mr. Bessemer to dispense with the services of a man, and has thus completed his scheme of a steady saloon, by making the machinery completely automatic; but should at any time the gyroscope fail to act, it is so arranged that a man can at once take charge of the controlling machinery, and thus prevent the cabin becoming useless for its first object. The saloon is 70 ft. long, 35 ft. wide, and 20 ft. high. On the left-hand side, just within the apartment, is a spacious staircase leading to the top, thus enabling passengers to enjoy the sea breeze, and at the same time be free from feeling the motion of the ship; and this without having first to traverse any portion of the vessel proper.

On the right-hand side of the engine will be a retiring-room, so that if, even in the saloon, any person should find the 'sea air' too much for him, he can withdraw from the public gaze. Ranged round the saloon will be a row of seats, and it is intended to ornament the sides in a very tasteful manner with panels. There will be carved oak shields bearing the monogram 'B. S. C.' (Bessemer Steamship Company), and above these will be handsome oil paintings. At the far end of the saloon is a retiring-room to be used by ladies, and over that another. It may be mentioned that the different names and uses of the various auxiliary cabins have not yet been definitely decided upon, and they will remain in abeyance until the requirements of the traffic have made themselves manifest.

"One great desideratum in a ship's saloon is good ventilation, and this has been attended to with the greatest care. Two fans or blowers are employed, and are worked by the small auxiliary engine. One fan forces fresh air into long tubes passing under the seats and throughout the whole length and breadth of the saloon, and the pipes are punctured with small holes, so as not to create a draught in any particular part. The air thus supplied will be kept at a convenient temperature by passing through a heating apparatus, resembling very much an ordinary surface condenser. Thus, in cold weather, by regulating the supply of steam to the apparatus, the temperature may be comfortably warmed, and, by always maintaining a supply of fresh air, it will never become in

any degree vitiated. The heat is obtained from the exhausted steam from one of Galloway's engines. The other fan draws the foul air from the saloon, and discharges it overboard. The tubes conveying the air from the blowers are connected with those in the saloon by means of an intermediate pipe fitted with flexible joints. It is confidently expected that the arrangement of the saloon, together with the steadiness of the vessel, will entirely prevent sea-sickness. The recent addition to the original plan has been the placing of two light masts, one at either end: sails attached to these will tend to materially steady the steamer; but another great consideration was to give the vessel some assistance in turning, which, owing to her great length, would probably have been a somewhat slow process, as she would have to be moved in a wide circle. Entrance-ports or gangways are situated at the outer side of the paddle-box, so as to insure a safe and easy landing-place. The steering apparatus will be under the control of the officer on the bridge, which latter is fitted between each pair of paddle-boxes. The kitchens are on the sponsons at the fore end, and are capable of serving up a hot dinner. In the fore part is the accommodation for the crew, and a large space is appropriated to the stowage of luggage. For the latter purpose a crane is being fitted on board, and such arrangements are made as to prevent the boxes and other property of the passengers from being tumbled about, as is sometimes the case. The vessel will be provided with two large life-rafts, on the principle patented by Mr.

Christie, and four other boats will be ranged along the side of the vessel." *

THE "CASTALIA."

Another very remarkable ship has recently been constructed for carrying passengers across the English Channel without the unpleasant rolling which is experienced in the ordinary steamboats. The vessel which has received the above name has been designed by Captain Dicey, who formerly held an official position at the port of Calcutta. His Indian experience furnished him with the first suggestion of the new ship in the device which is adopted there for steadying boats in the heavy sea. The plan is to attach a log of timber to the ends of the outriggers, which project some distance from the side of the vessel ; or sometimes two canoes, a certain distance apart, are connected together. Some of these Indian boats will ride steadily in a swell that will cause large steamers to roll heavily. Improving on this hint, Captain Dicey has built a vessel with two hulls, each of which acts as an outrigger to the other. Or, perhaps, the *Castalia* may be described as a flat-bottomed vessel, with the middle part of the bottom raised out of the water throughout the entire length, so that the section amidships has a form like the engraving on the next page.

* Upon the *Bessemer* being tried at sea, her speed by no means realized the expectations of her designers, nor was the automatic regulator adopted, or the swinging saloon brought into operation.

The two hulls are connected by what we may term "girders," which extend completely across their sections, forming transverse partitions or bulkheads, and these girders are strongly framed together, so as to



THE "CASTALIA" IN DOVER HARBOUR.

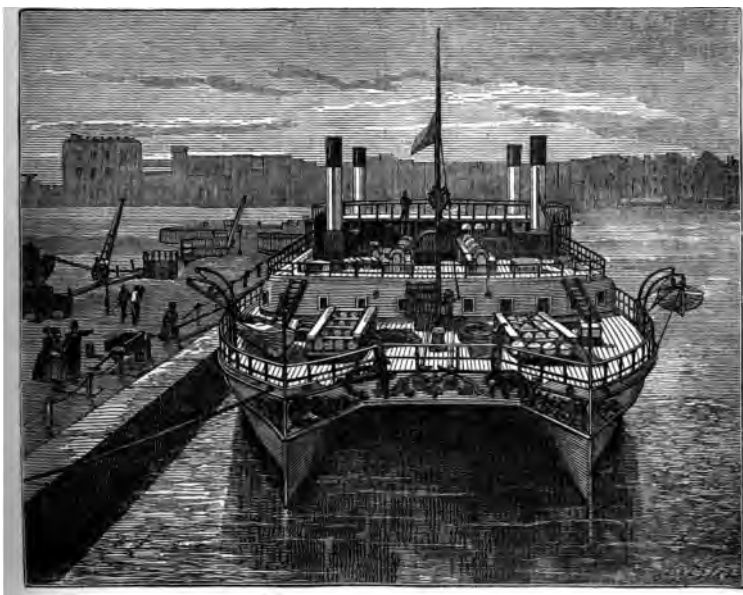
form rigid triangles. These unite the two hulls so completely, that there is not the least danger of the vessel being strained in a sea-way. The decks are also formed of iron, although covered with wood, so that the whole vessel really forms a box girder of enormous section.

The reason why the steamers which have hitherto run

between Dover and Calais, Folkestone and Boulogne, and other Channel ports, are so small, is because the harbours on either side could not receive vessels with such a draught as the fine steamers, for example, which run on the Holyhead and Kingston line. Now, the *Castalia* draws only 6 ft. of water, or 1 ft. 6 in. less than the present small Channel steamers, and she will therefore be able to enter the French ports at all states of the tide. Yet the extent of the deck space is equalled in few passenger ships afloat, except the *Great Eastern* and some of the Atlantic steamers. The vessel is 290 ft. in length, with an extreme breadth of 60 ft. The four spacious and elegantly-fitted saloons—two of which are 60 ft. by 36 ft., and two 28 ft. by 26 ft.—and the roomy cabins, retiring-rooms, and lavatories, offer the greatest possible contrast to the “cribbed, cabined, and confined” accommodation of the ordinary Channel steamers. There are also a kitchen and all requisites for supplying dinners, luncheons, &c., on board. But, besides the above-named saloons and cabins, there is a grand saloon, which is 160 ft. long and 60 ft. wide; and the roof of this forms a magnificent promenade 14 ft. above the level of the sea. There is comfortable accommodation in the vessel for more than 1,000 passengers.

The inner sides of the hulls are not curved like the outside, but are straight. The space between them is 35 ft. wide, and the hulls are each 20 ft. in breadth, and somewhat more in depth. There are two paddle-wheels, placed abreast of each other in the water-way between

the two hulls, and each of these contains boilers and powerful engines. The designers of this vessel calculated that she would attain a speed of $14\frac{3}{4}$ knots per hour, but this result has not been realized. Probably there were



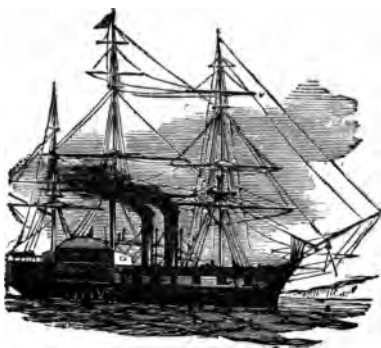
THE "CASTALIA" IN DOVER HARBOUR—END VIEW.

no data for the effect of paddles working in a confined water-space. The position of the paddles is otherwise an advantage, as it leaves the sides of the vessel free and unobstructed. The ship is of the same form at each end, so that it can move equally well in either direction. There are rudders at both ends, and the steering qualities

of the ship are admirable. Although the speed of the *Castalia* is below that intended, the vessel is quite a success as regards steadiness, for the rolling and pitching have been very greatly reduced, and the miseries and inconveniences of the Channel passage have, it is hoped been at length obviated.

The *Castalia* is represented in the cuts on pages 319 and 321. She was constructed by the Thames Iron Ship-building Co., and launched in June, 1874, but after she had been tried at sea, it was found necessary to fit her with improved boilers, and this caused a delay in placing the vessel on her station.





CHAPTER XXV.

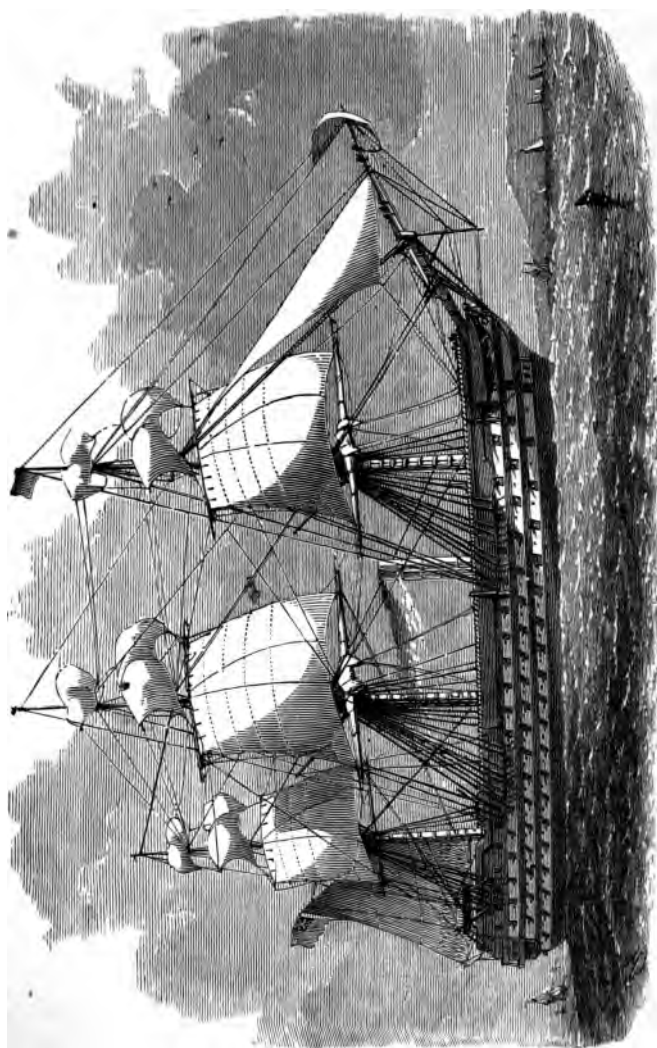
Improvements in the Royal Navy—The *Victory*—The *Dreadnaught*—New models—The *Penelope*—The *Duke of Wellington*—Massacre of Sinope—Iron armour-plates—The *Warrior*—The *Hercules*—The *Inconstant*—Captain Coles—The *Captain*—Gravity and Buoyancy—The *Glatton*—The *Devastation* and the *Thunderer*—The *König Wilhelm*—Armour-plates *versus* guns—British sailors.

GRANDPA has told you so much about the *Prince of Wales*, which in his day was the kind of war-ship in the Royal Navy of England, that it does not seem necessary to say anything more about the old-fashioned line-of-battle ships, except that many larger ships than the one he served in were built, and that there were three-deckers, two-deckers, frigates, corvettes, and others of lower classes. The *Victory*, launched in 1765, and now lying at Portsmouth, is a fine specimen of the first-class

line-of-battle ship of the latter half of the last century ; she was armed with 104, afterwards with 110 guns, the largest of which were 32-pounders. The old *Dreadnaught*, so long a hospital ship in the Thames off Greenwich, was another example well known to many of my readers.

For a long period all our fighting ships had been built on one model—the builders being restricted to a few feet additional length or breadth, as their knowledge or taste dictated ; but as larger guns came into use, it became evident that some improvement was necessary, and in the early part of the present century many suggestions were offered to the Admiralty, and much discussion took place as to the proper build of ships of war, and a keen competition was entered into by eminent ship-designers, who received permission from the Admiralty to try and improve the sailing qualities of the ships they were allowed to construct on the established models.

The effect of this permission was to stimulate all who were concerned in ship-building, and the introduction of steam-power into ships-of-war led to many experiments being made. The *Penelope*, 46-gun frigate, was cut in two, lengthened about 65 feet, and fitted with paddle-wheel engines of 650 horse-power. Other paddle-wheel frigates followed ; but it was soon found that the paddle-wheels interfered with the broadside fire, and were liable to be damaged by shot in action, and, as I have before stated, the screw-propeller was substituted for paddle-wheels in all future fighting ships.



H.M.S. "DUKE OF WELLINGTON."

The *Duke of Wellington* was a specimen of the most powerful fighting ship of that day ; she carried 130 guns, the heaviest of which were 68-pounders, and was in all respects an improvement on the *Victory*. She was a wooden screw steamship, launched in 1852, and was able to steam $10\frac{1}{2}$ knots per hour.

In 1853 the war with Russia occurred, and what has been termed "The Massacre of Sinope," where a Turkish squadron, consisting of seven frigates, three corvettes, and two steamers, was destroyed by the Russian fleet on the 30th of November, 1853, only one steamer escaping. This proved that wooden ships were no match for the heavier guns in use, even the *Duke of Wellington*, although much superior to the *Victory* in her powers of attack, having no better means of defence, for while the heaviest gun the *Victory* had to meet was a 32-pounder, the *Duke of Wellington* had to meet 68-pounders supplied with shells, which could easily pass through her sides and inflict irreparable injury.

If what I have stated be clear to you, it will be seen that it is of little use to increase the attacking power of a ship if the defensive power be not at least equally increased, for we may be sure that, however we may increase in effectiveness, other nations will try to do the same. With this view many eminent naval architects and engineers set to work to devise means for rendering the sides of ships at least as impervious to the shot and shell that could be brought against them as those of former times were, and thus ensure our hardy tars as

much protection as possible, while giving their courage and skill as full play in future naval warfare as they formerly had, instead of exposing them to a chance of total destruction before either could be made available.



H.M.S. "DEVASTATION" IN QUEENSTOWN HARBOUR.


I again take my account from "Discoveries and Inventions of the Nineteenth Century":—

Floating batteries, plated with iron, were employed in the Crimean War at the instigation of the French

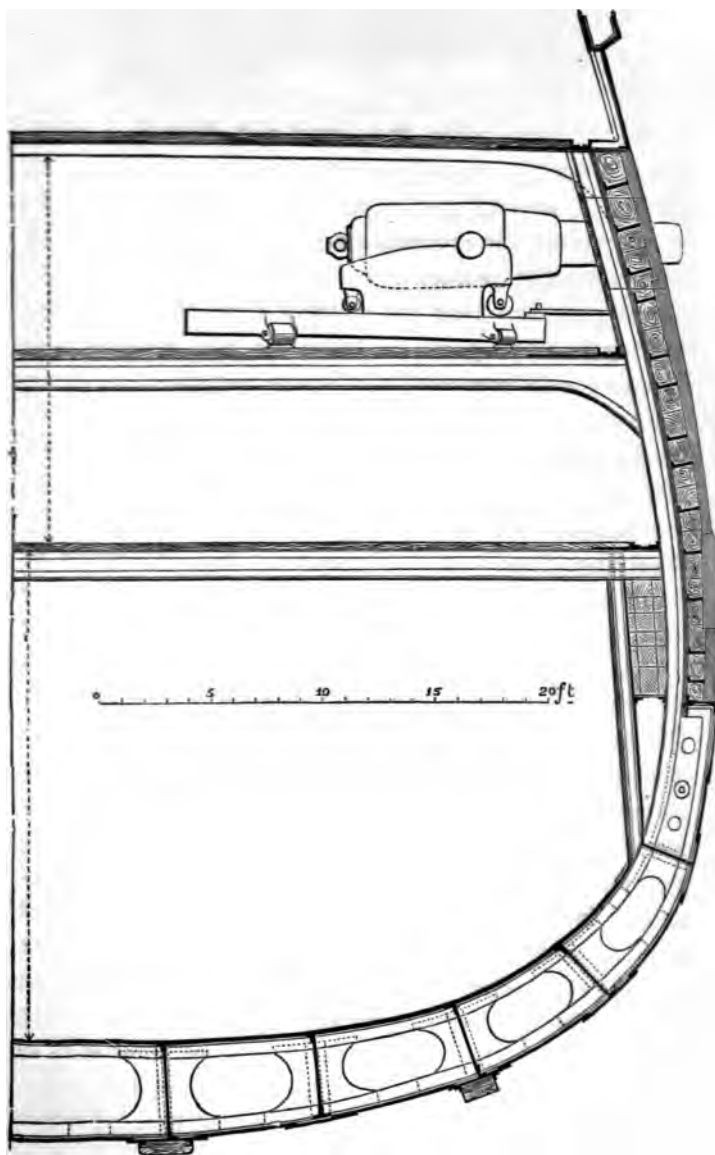
Emperor. About the same time the question of protecting ships of war by some kind of defensive armour was forced upon the attention of maritime powers, by the great strides with which the improvements in artillery were advancing; for the new guns could hurl projectiles capable of penetrating, with the greatest ease, any wooden ship afloat. The French Government took the initiative by constructing *La Gloire*, a timber-framed ship, covered with an armour of rolled iron plates, $4\frac{1}{2}$ inches thick. The British Admiralty quickly followed with the *Warrior*, a frigate similar in shape to the wooden frigates, but built on an iron frame, with armour composed of plates $4\frac{1}{2}$ inches thick, backed by 18 inches of solid teak-wood, and provided with an inner skin of iron. The *Warrior* is 380 feet long, but only 213 feet of this length is armoured. The defensive armour carried by the *Warrior*, and the ironclads constructed immediately afterwards, was quite capable of resisting the impact of the 68-lb. shot, which was at that time the heaviest projectile that could be thrown by naval guns. But to the increasing power of the new artillery it soon became necessary to oppose increased thickness of iron plates. The earlier ironclads carried a considerable number of guns, which could, however, deliver only a broadside fire, that is, the shots could, for the most part, be sent only in a direction at right angles to the ship's length, or nearly so. But in the more recently built ironclads there are very few guns, which are, however, six times the weight of the old 68-pounders, and

are capable of hurling projectiles of enormous weight. The ships built after the *Warrior* were completely protected by iron plates, and the thickness of the plates has been increased from time to time, with a view of resisting the increased power which has been progressively given to naval guns. A contest, not yet terminated, has been going on between the artillerist and the ship-builder ; the one endeavouring to make his guns capable of penetrating with their shot the strongest defensive armour of the ships, the other adding inch after inch to the thickness of his plates, in order, if possible, to render his ship invulnerable.

One of the finest of the large ironclads is the *Hercules*, of which a section amidships is presented on the opposite page. This ship is 325 feet in length, and 59 feet in breadth, and is fitted with very powerful engines which will work up to 8,529 indicated horse-power. The tonnage is 5,226 ; weight of hull, 4,022 tons ; weight of the armour and its backing, 1,690 tons ; weight of engines, boilers, and coals, 1,826 tons ; weight of equipment and armament, 8,676 tons. Although the *Hercules* carries this enormous weight of armour and armament, her speed is very great, excelling, in fact, that of any merchant steamer afloat, for she can steam at the rate of nearly 17 miles an hour. She also possesses, in a remarkable degree, the property which naval men call *handiness*—that is, she can be quickly turned round in a comparatively small space. The handiness of a steamer is tested by causing her to steam at full speed with the



helm hard over, when the vessel will describe a circle, The smaller the diameter of that circle, and the shorter the time required to complete it, the better will the vessel execute the movements required in naval tactics. Comparing the performances of the *Warrior* and the *Hercules*, we find that the smallest circle the former can describe is 1,050 yards in diameter, and requires nine minutes for its completion, whereas the latter can steam round a circle of only 560 yards diameter in four minutes. The section shows that, like the *Great Eastern*, the *Hercules* is constructed with a double hull, so that she would be safe, even in the event of such an accident as actually occurred to the *Great Eastern*, when a hole was made by the stripping off of her bottom plates, 80 feet long and 5 feet wide. The defensive armour of the *Hercules* is, it will be observed, greatly strengthened near the water-line, where damage to the ship's side would be most fatal. The outer iron plates are here 9 inches thick, while in other parts the thickness is 8 inches, and in the less important position 6 inches. The whole of the hull is, however, completely protected above the water-line, and the iron plates are backed up by solid teak-wood for a thickness of from 10 inches to 12 inches. The teak is placed between girders, which are attached to another iron plating $1\frac{1}{2}$ inches thick, supported by girders 2 feet apart. The spaces between these girders are also filled with teak, and the whole is lined with an inner skin of iron plating, $\frac{3}{4}$ inch thick. The belt along the water-line has thus altogether $11\frac{1}{4}$ inches of iron, of which

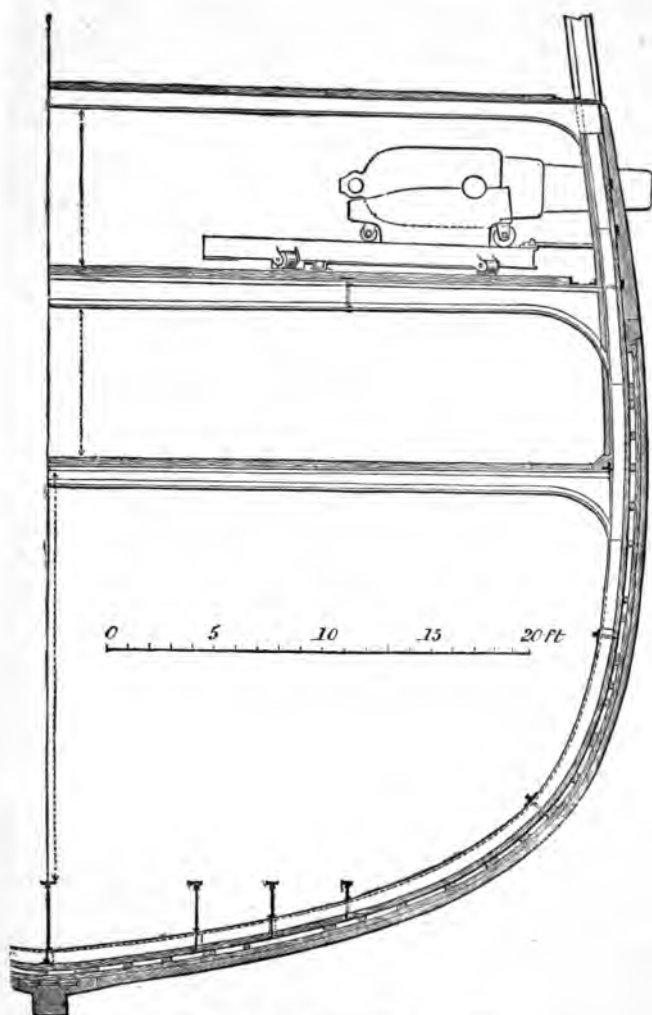


SECTION OF H.M.S. "HERCULES."

9 inches are in one thickness, and this part is, moreover, backed by additional layers of teak, as shown in the section; so that, besides the $11\frac{1}{4}$ inches of iron, the ship's side has here 3 feet 8 inches total thickness of solid teak-wood. The deck is also covered with iron plates, to protect the vessel from vertical fire. The *Hercules* carries eight 18-ton guns as her central battery, and two 12-ton guns in her bow and stern: these guns are rifled, and each of the larger ones is capable of throwing a shot weighing 400 lbs. The guns can be trained so as to fire within 15° of the direction of the keel; for near the ends of the central battery the ports are indented, and the guns are mounted on Scott's carriages, in such a manner that any gun-slide can be run on to a small turntable, and shunted to another port, just as a railway-carriage is shunted from one line to another. Targets for artillery practice were built so as to represent the construction of the side of the *Hercules*, and it was found, as the result of many experiments, that the vessel could not be penetrated by the 600 lb. shot from an Armstrong gun, fired at a distance of 700 yards. The production of such iron plates, and those of even greater thickness which have since been used, forms a striking example of the skill with which iron is worked. These plates are made by rolling, and it will be understood that the machinery used in their formation must be of the most powerful kind, when it is stated that plates from 9 inches to 15 inches thick are formed with a length of 16 feet and a breadth of 4 feet. The plates

are bent, while red hot, by enormous hydraulic pressure, applied to certain blocks, upon which the plates are laid, the block having a height adjusted according to the curve required. The operation requires great care, as it must be accomplished without straining the parts in a manner injurious to the strength of the plate.

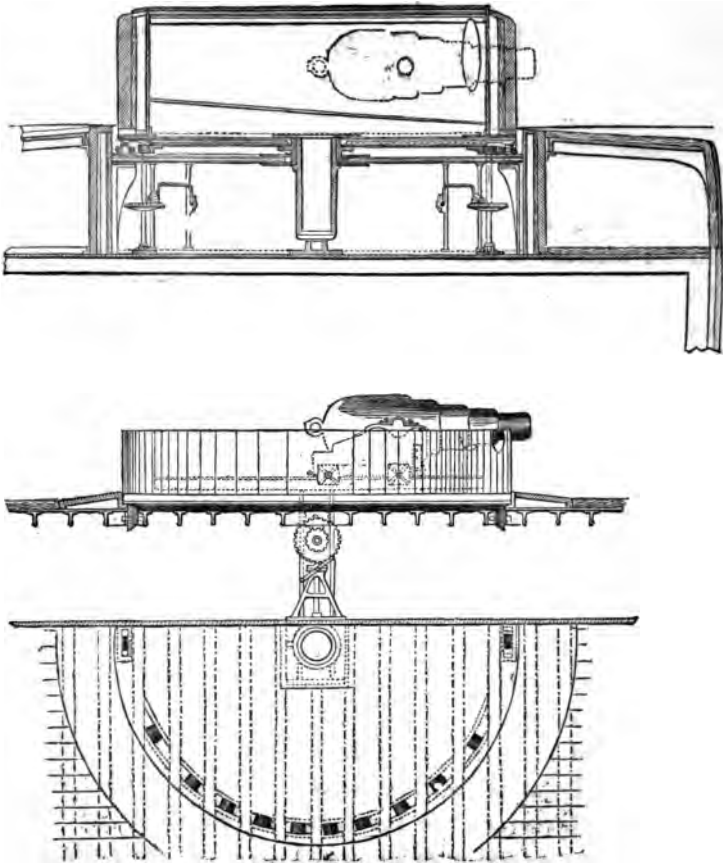
The figure on the next page is the section of another ship-of-war, the *Inconstant*, which has not, like the *Hercules*, been designed to withstand the impact of heavy projectiles, but has been built mainly with a view to speed. The *Inconstant* has only a thin covering of iron plating, except in that portion of the side which is above water, where there is a certain thickness of iron diminishing from the water-line upwards, but not enough to entitle the *Inconstant* to be classed as an armoured vessel. This ship, however, may be a truly formidable antagonist, for she carries a considerable number of heavy guns, guns which her speed would enable her to use with great effect against an adversary incapable of manœuvring so rapidly. She could give chase, or could run in and deliver her fire, escaping by her speed from hostile pursuit in cases where the slower movements of a ponderous ironclad would be much less effective. The *Inconstant* carries ten 12-ton guns of 9-inch calibre, and six 6-ton 7-inch guns, all rifled muzzle-loaders, mounted on improved iron carriages, which give great facilities for handling them. The ship is a frigate 338 feet long and 50 feet broad, with a depth in the hold of 17 feet 6 inches. She is divided by bulkheads into eleven water-tight com-



SECTION OF H.M.S. "INCONSTANT."

partments. The engines are of 6,500 indicated horsepower, and the vessel attains an average speed of more than 18½ miles per hour.

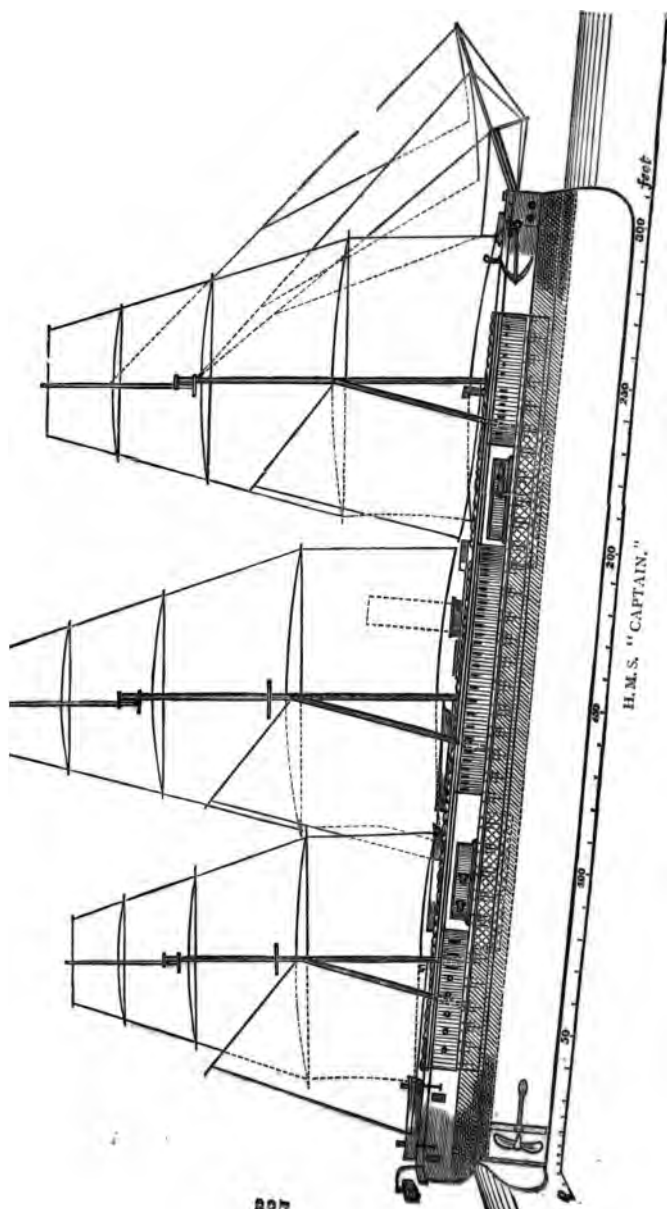
A new system of mounting very heavy naval guns was proposed by Captain Coles about 1861. This plan consists in carrying one or two very heavy guns in a low circular tower or turret, which can be made to revolve horizontally by proper machinery. The turret itself is heavily armoured, so as to be proof against all shot, and is carried on the deck of the ship, which is so arranged that the guns in the turret can be fired at small angles with the keel. The British Admiralty having approved of Captain Coles' plans, two first-class vessels were ordered to be built on the turret system. These were the *Monarch* and the *Captain*—the latter of which we select for description on account of the melancholy interest which attaches to her. On page 324 a diagram is given representing the profile of the *Captain*, in which some of the peculiarities of the ship are indicated, the turrets with the muzzles of two guns projecting from each being easily recognized. The *Captain* was 320 feet long and 53 feet wide. She was covered with armour plates down to 5 feet below the water-line, as represented by the dark shading in the diagram. The outer plating was 8 inches thick opposite the turrets, and 7 inches thick in other parts. It was backed up by 12 inches of teak. There were two inner skins of iron, each ¾ inch thick, then a framework with longitudinal girders 10 inches deep. The deck was plated in the spaces opposite the turrets with



SECTION, ELEVATION, AND PLAN OF TURRET OF H.M.S. "CAPTAIN."

iron $1\frac{1}{2}$ inches thick. The *Captain* was fitted with twin screws—that is, instead of having a single screw, one was

placed on each side, their shafts being of course parallel with the vessel's length. The object of having two screws was not greater power—for it is probable that a single screw would be more effectual in propelling the ship—but this arrangement was adopted because it was considered that, had only one screw been fixed, the ship might easily be disabled by the breaking of a blade or shaft; whereas in the case of such an accident to one of the twin screws, the other would still be available. The twin screws could also be used for steering, and the vessel could be controlled without the rudder, as the engines were quite independent of each other, each screw having a separate pair. The diameter of the screws was 17 feet. The erections which are shown on the deck between the turrets afforded spacious quarters for the officers and men. These structures were about half the width of the deck, and tapered off to a point towards the turrets, so as to leave an unimpeded space for training the guns, which could be fired at so small an angle as 6° with the length of the vessel. Above these erections, and quite over the turrets, was another deck, 26 feet wide, called the "hurricane deck." The ship was fully rigged, and carried a large spread of canvas. But the special features are the revolving turrets, and one of these is represented in the figure on page 335, which gives a section, part elevation, and plan. Of the construction of the turret, and of the mode in which it was made to revolve, these drawings convey an idea sufficiently clear to obviate the necessity of a minute description. Each



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turret had an outside diameter of 27 feet, but the diameter inside was only 22 feet 6 inches, the walls being, therefore, 2 feet 3 inches thick, nearly half this thickness consisting of iron plating. Separate engines were provided for turning the turrets, and they could also be turned by men working at the handles shown in the figures. Each turret carried two 25-ton Armstrong guns, capable of receiving a charge of 70 lbs. of gunpowder, and of throwing a 600-pound shot.

After some preliminary trials the *Captain* was sent to sea, and behaved so well that Captain Coles and Messrs. Laird, her designer and contractors, were perfectly satisfied with her qualities as a sea-going ship. She was then sent in the autumn of 1870 on a cruise with the fleet, and all went well until a little after midnight between the 6th and 7th September, 1870, when she suddenly foundered at sea off Cape Finisterre. The news of this disaster created a profound sensation throughout Great Britain, for, with the exception of nineteen persons, the whole crew of 500 persons went down with the ship. Captain Coles, the inventor of the turrets, was in the ill-fated vessel and perished with the rest, as did also Captain Burgoyne, the gallant commander, and the many other distinguished naval officers who had been appointed to the ship; among the rest was a son of Mr. Childers, then First Lord of the Admiralty. Although the night on which this unfortunate ship went down was squally, with rain, and a heavy sea running, the case was not that of an ordinary shipwreck in which a vessel is overwhelmed

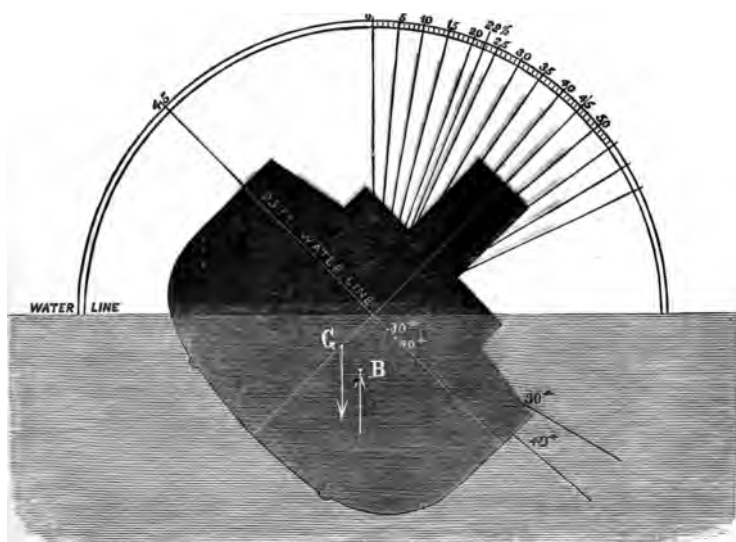
by a raging storm. It might be said, indeed, of the loss of the *Captain* as of that of the *Royal George* :

"It was not in the battle ;
No tempest gave the shock ;
She sprang no fatal leak ;
She ran upon no rock."

One of the survivors, Mr. James May, a gunner, related that shortly after midnight he was roused from his sleep by a noise, and feeling the ship uneasy, he dressed, took a light, and went into the after turret, to see if the guns were all right. He found everything secure in the turret, but that moment he felt the ship heel steadily over, and a heavy sea having struck her on the weather side, the water flowed into the turret, and he got out through the hole in the top of the turret by which the guns were pointed, only to find himself in the water. He swam to the steam-pinnace, which he saw floating bottom upwards, and there he was joined by Captain Burgoyne and a few others. He saw the ship turn bottom up, and sink stern first, the whole time from her turning over to sinking not being more than a few minutes. Seeing the launch drifting within a few yards, he called out "Jump, men ! it is your last chance." He jumped, and with three others reached a launch, in which were fifteen persons, all belonging to the watch on deck, who had found means of getting into this boat. One of these had got a footing on the hull of the ship as she was turning over, and he actually walked over the bottom of the vessel, but was washed off by a wave and rescued by those who in the meantime had

got into the launch. It appears that Captain Burgoyne either remained on the pinnace or failed to reach the launch. Those who were in that boat, finding the captain had not reached them, made an effort to turn their boat back to pick him up, but the boat was nearly swamped by the heavy seas, and they were obliged to let her drift. One man was at this time washed out of the boat and lost, after having but the moment before exclaimed, "Now, lads, I think we are all right." After twelve hours' hard rowing, without food or water, the survivors, numbering sixteen men and petty officers and three boys, reached Cape Finisterre, where they received help and attention. On their arrival in England a court-martial was, according to the rules of the service, formally held on the survivors, but in reality it was occupied in investigating the cause of the catastrophe. The reader may probably be able to understand what the cause was by giving his attention to some general considerations, which apply to all ships whatever, and by a careful examination of the diagrams, which are copied from diagrams that were placed in the hands of the members of the court-martial. The letters B and G and the arrows are, however, added to serve in illustration of a part of the explanation. The vessel is represented as heeled over in smooth water, and the gradations on the semicircle in our illustration will enable the reader to understand how the heel is measured by angles. If the ship was upright, the centre line would coincide with the upright line, marked O on the semicircle and drawn from its centre. Suppose a level line drawn

through the centre of the semicircle, and let the circumference between the point where the last line cuts it and the point O be divided into ninety equal parts, and let these parts be numbered, and straight lines drawn from the centre to each point of division. In the figure the lines are drawn at every fifth division, and the centre line



of the ship coincides with that drawn through the forty-fifth division. In this case the vessel is said to be inclined, or heeled, at an angle of forty-five degrees, which is usually written 45° . In a position half-way between this and the upright the angle of heel would be $22\frac{1}{2}^\circ$, and so on. The reader no doubt perceives that a ship,

with the hoop ; but in whatever position the hoop may be placed, the earth's attraction pulls it *as if* this central point were rigidly connected with the hoop, and a string were attached to the point and constantly pulled downwards. This explanation of the meaning of centre of gravity may not be altogether superfluous, for, when the causes of the loss of the *Captain* were discussed in the newspapers, it became evident that such terms as "centre of gravity" convey to the minds of many but very vague notions. One writer in a newspaper enjoying a large circulation seriously attributed the disaster to the circumstance of the ship having lost her *centre of gravity* ! The upward pressure of water which supports a ship is the same upward pressure which supported the water before the ship was there—that is, supported the mass of water which the ship displaces, and which was in size and shape the exact counterpart of the immersed part of the ship. Now, this mass of water, considered as a whole, had itself a centre of gravity through which its weight acted downwards, and through which it is obvious that an equal upward pressure also acted. This centre of gravity of the displaced water is usually termed the "centre of buoyancy," and, unlike the centre of gravity, it changes its position with regard to the ship when the latter is inclined, because then the immersed part becomes of a shape different for each inclination of the ship. Now, recalling for an instant the fundamental law of floating bodies—namely, that the weight of the water displaced is equal to the weight of the floating body—we perceive

that in the case of a ship there are two equal forces acting vertically, viz., the weight of the ship or downward pull of gravitation acting at G, the centre of gravity of the ship, and an equal upward push acting through B, the centre of buoyancy. It is obvious that the action of these forces concur to turn a ship placed as in the picture into the upright position. It is by no means necessary for this effect that the centre of gravity should be below the centre of buoyancy. All that is requisite for the stability of a ship is, that when the ship is placed out of the upright position, these forces should act to bring her back, which condition is secured so long as the centre of buoyancy is nearer to the side towards which the vessel is inclined than the centre of gravity is. When there is no other force acting on a ship or other floating body, these two points are always in the same vertical line. The two equal forces thus applied in parallel directions constitute what is called in mechanics a "couple," and the effect of this in turning the ship back into the upright position is the same as if a force equal to its weight were applied at the end of a lever equal in length to the horizontal distance between the lines through B and G. The righting force, then, increases in proportion to the horizontal distances between the two points, and it is measured by multiplying the weight of the ship in tons by the number of feet between the verticals through G and B, the product being expressed in statical foot-tons, and representing the weight in tons which would have to be applied to the end of a lever 1 foot long, in order to produce the same

turning effect. When a ship is kept steadily heeled over by a side wind, the presence of the wind and the resistance of the water through which the vessel moves constitutes another couple exactly balancing the righting couple. The moment of the righting couple, or the righting force, or statical stability, as it is also called, are determined by calculation and experiment from the design of the ship, and from her behaviour when a known weight is placed in her at a known distance from the centre. Such calculations and experiments were made in the case of the *Captain*, but do not appear to have been conducted with sufficient care and completeness to exhibit her deficiency in stability. After the loss of the ship, however, elaborate computations on these points were made from the plans and other data. The following table gives some of the results, with the corresponding particulars concerning the *Monarch* for the sake of comparison :—

	<i>Monarch.</i>	<i>Captain.</i>
I. Angle at which the edge of the deck is immersed	28°	14°
II. Statical righting force in foot-tons at the angle at which the deck is immersed	12,542	5,700
III. Angle of greatest stability	40°	21°
IV. Greatest righting force in foot-tons	15,615	7,100
V. Angle at which the righting force ceases... ..	59°	54°
VI. Reserve of dynamical stability at an angle of 14° in dynamical foot-tons	6,500	410

From No. V. in the above table we learn that if the *Captain* had been heeled to 54°, the centre of gravity

would have overtaken the centre of buoyancy—that is, the two would have been in one vertical line. Any further heeling would have brought the points into the position shown in the cut on page 342, where it is obvious that the action of the forces is now to turn the vessel still more on its side, and the result is an upsetting couple instead of a righting couple.

These figures and considerations refer to the case of a vessel floating in smooth water, but the case of a vessel floating on a wave is not different in principle. The reader may picture to himself the diagrams inclined so that the water-line may represent a portion of the wave's surface; then he must remember that the very action which heaves up the water in a sloping surface is so compounded with gravity that the forces acting through G and B retain nearly the same position relatively to the surface as before.

No. VI. in the foregoing table requires some explanation. To heel a ship over to a certain angle a certain amount of *work* must be done, and in the scientific sense *work* is done only when something is moved through a space against a resistance. When the weight of a ton is raised 1 foot high, one foot-ton of work is said to be done; if 2 tons were raised 1 foot, or 1 ton were raised 2 feet, then 2 foot-tons of work would be done, and so on. The same would be the case if a pressure equal to those weights were applied so as to move a thing in any direction through the same distances. It should be carefully noticed that the foot-ton is quite a different unit in this

case from what it is at the moment of a couple. If we heel a ship over by applying a pressure on the masts, it is plain that the pressure must act through a certain space, and the same heel could be caused either by means of a smaller pressure or a greater, according as we apply it higher up or lower down; but the space through which it must act would vary, so that the product of the pressure and space would, however, be always the same. No. VI. shows the amount of work that would have to be done in order completely to upset each of the vessels when already steadily heeled over to 14° . The amounts in the two cases are so different that we can easily understand how a squall which would not endanger the *Monarch* might throw the *Captain* over. A squall suddenly springing up would do more than heel a vessel over to the angle at which it is able to maintain it: it would swing it beyond that position by reason of the work done on the sails as they are moving over with the vessel, and the latter would come to a steady angle of heel only after a series of oscillations. Squalls again, which, although suddenly springing up in this manner, could not heel the ship over beyond the angle where the stability vanishes, might yet do so if they were intermittent and should happen to coincide in time with the oscillations of the ship—just as a series of very small impulses, coinciding with the time of the vibrations of a heavy pendulum, may accumulate so as to increase the range of vibration to any extent. It is believed that in the case of the *Captain* the pressure of the wind on the under-side of the hurricane


assisted in upsetting the vessel. This, however, could only have exerted a very small effect compared to that produced by the sails. The instability of the *Captain* does not appear to have been discovered by such calculations as were made before the vessel went to sea. It was observed, however, that the ship when afloat was 1 foot 6 inches deeper in the water than she should have been—in other words, the freeboard, or side of the ship out of the water, instead of being 8 feet high as intended, was only 6 feet 6 inches and such a difference would have a great effect on the stability.

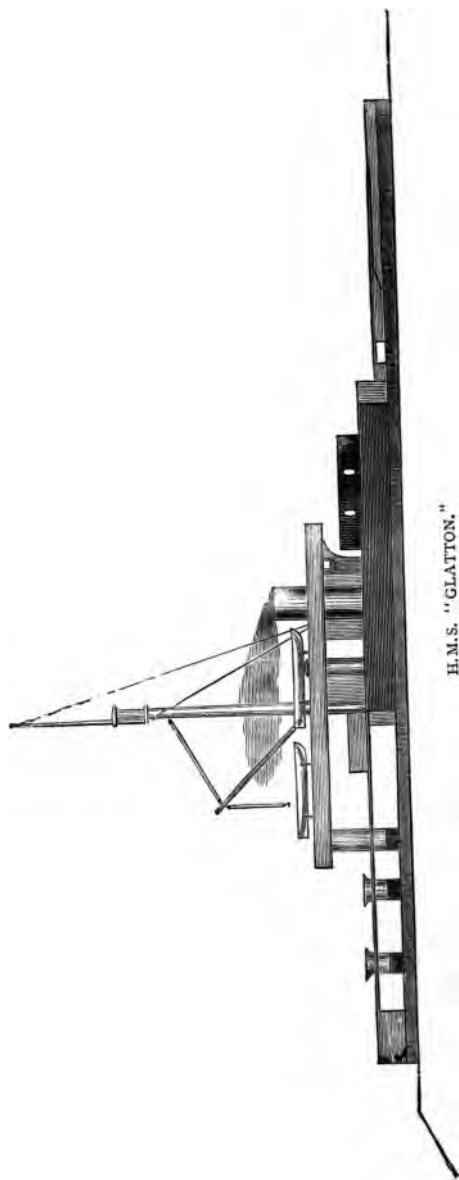
The turret system has been applied to other ships on quite a different plain. Of these the *Glatton* is one of the most remarkable. Her appearance is very singular, and totally unlike that which we look for in a ship, as may be seen by the cut on page 351. The *Glatton*, which was launched in 1871, is of the *Monitor* class, and was designed by Mr. E. J. Reed, who has sought to give the ship the most complete protection. With this view the hull is covered with iron plates below the water-line, and the deck also is cased with 3-inch iron plates, to resist shot or shell falling vertically. The base of the turret is shielded by a massive breastwork, which is a peculiarity of this ship. The large quantity of iron required for all these extra defences has, of course, the effect of increasing the immersion of the vessel, and therefore of diminishing her speed. The freeboard, when the ship is in ordinary trim, is only 3 feet high, and means are provided for admitting water to the lowest compartment, so

as to increase the immersion by 1 foot, thus reducing the freeboard to only 2 feet when the vessel is in fighting trim, leaving only that small portion of the hull above water as a mark for the enemy. The water ballast can be pumped out when no longer needed. The *Glatton* is 245 feet long and 54 feet broad, and she draws 19 feet of water with the freeboard of 3 feet, displacing 4,865 tons of water, while with the 2 feet freeboard the displacement is 5,179 tons. This ship cost £210,000. Mr. Reed wished to construct a vessel of much larger size on the same plan—a proposal to which, however, the Admiralty did not then consent. The *Glatton* is, nevertheless, one of the most powerful ships of war ever built, and may be considered as an impregnable floating fortress. Above the water-line the hull is covered with armour plates 12 inches thick, supported by 20 inches of teak backing, and an inner layer of iron 1 inch thick. Below the water-line the iron is 8 inches thick, and the teak 10 inches. The revolving turret carries two 25-ton guns, firing each a 600-lb. shot, and is covered by a massive plating of iron 14 inches in thickness. Besides this the base of the turret is protected by a breastwork rising 6 feet above the hull. This breastwork is formed of plates 12 inches thick, fastened on 18 inches of teak. The turret rises 7 feet above the breastwork, and therefore the latter in no way impedes the working of the guns. The *Glatton* has a great advantage over all the other turret ships in having a perfectly unimpeded fore range for her guns, for there is no mast or other object to prevent the guns

being fired directly over the bow. There are no sails, the mast being intended only for flying signals and hoisting up boats, &c. The hull is divided by vertical partitions into nine water-tight compartments, and also into three horizontal flats—the lowest being air-tight, and having arrangements for the admission and removal of water, as already mentioned. The stem of the ship is protruded forwards below the water for about 8 feet, thus forming a huge ram which would itself render the *Glatton* a truly formidable antagonist at close quarters, even if her guns were not used. The engines are capable of being worked up to 3,000 horse-power, giving the ship a speed of $9\frac{1}{2}$ knots per hour, and means are provided for turning the turret by steam power. The turret can be rotated by manual labour, requiring about three minutes for its complete revolution, but by steam power the operation can be effected in half a minute. The commander communicates his orders from the pilot-house on the hurricane deck to the engine-room, steering-house, and turret, by means of speaking-tubes and electric telegraphs. The *Glatton* was not designed to be ocean-going, but is intended for coast defence.

The British navy contains two powerful turret-ships constructed on the same general plan as the *Glatton*, but larger, and capable of steaming at a greater speed, and of carrying coal for a long voyage. These sister ships are named the *Devastation* and the *Thunderer*. The *Thunderer* has two turrets and a freeboard of 4 feet 6 inches. Space is provided for a store of 1,800 tons of





H.M.S. "GLATTON."

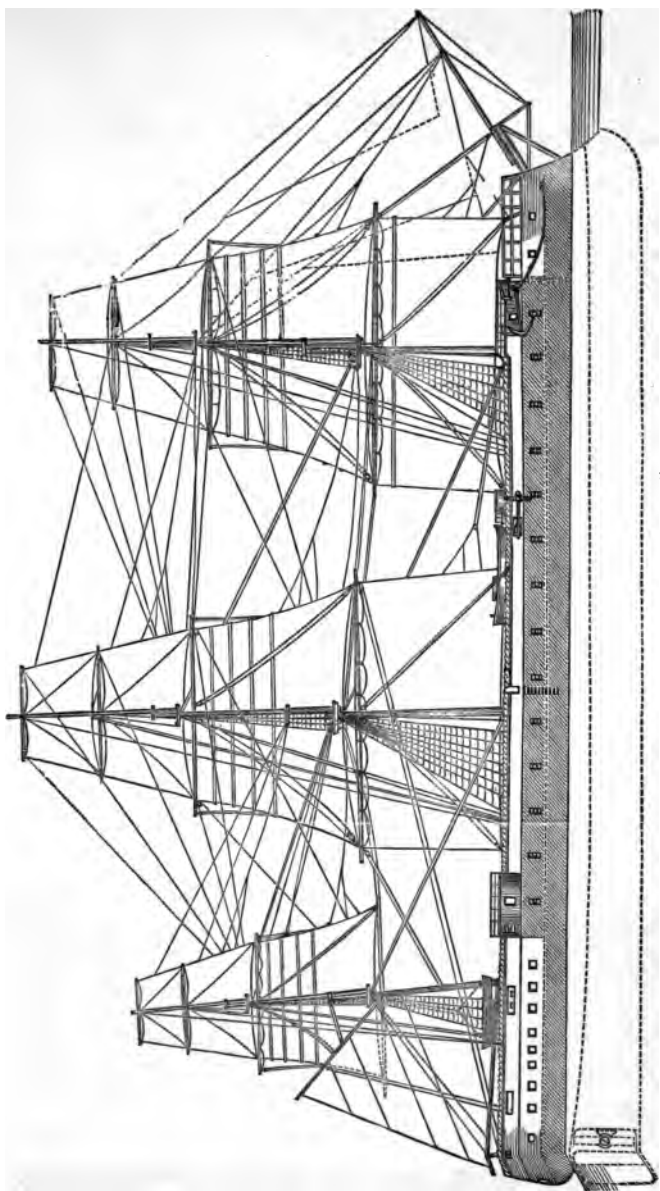


H.M.S. "THUNDERER."

coal, of which the *Glatton* can carry only 500 tons. The vessel is fitted with twin screws, turned by two pairs of independent engines, capable of working up to 5,600 horse-power, and she can steam at the rate of 12 knots, or nearly 14 miles an hour. With the large supply of coal she can carry, the *Thunderer* could make a voyage of 3,000 miles without re-coaling. Though the freeboard of the heavily-plated hull is only 4 feet 6 inches, a lighter iron superstructure, indicated in the figure by the light shading, rises from the deck to the height of 7 feet, making the real freeboard nearly 12 feet. This gives the ship much greater stability, and prevents her from rolling heavily when at sea. The length is 285 feet, and the width 58 feet, and the draught 26 feet. The hull is double, the distance between the outer and inner skins of the bottom being 4 feet 6 inches. The framing is very strong and on the longitudinal principle, and the keel is formed of Bessemer steel. Each turret is 24 feet 3 inches in internal diameter, and is built with five layers of teak and iron. Beginning at the inside, there is a lining of $2\frac{5}{8}$ inches iron plates; then 6 inches of teak in iron frames, arranged horizontally; 6 inches of armour plates; 9 inches of teak, placed vertically; outside of all, 8-inch armour plates. Each turret carries two Fraser 35-ton guns, rifled muzzle-loaders. The turrets revolve by hand or by steam-power. There are no sails, and thus a clear range for the guns is afforded fore and aft. The bases of the turrets are protected by the armoured breastwork, of which a portion is seen in the figure in advance of the fore turret.

Another very powerful ship of war, which possessed some special features, is represented in the diagram on the following page (355). This vessel, named the *König Wilhelm*, was built at Blackwall for the Prussian Government by the Thames Ironworks and Steam Shipbuilding Company, from designs by Mr. Reed. Her length was 365 feet; width, 60 feet; burthen, 6,000 tons; displacement, 8,500 tons. She was framed longitudinally, that is, girders pass from end to end, about 7 feet apart, with a stem projecting into a pointed ram. In this case also the hull was double; there was, in fact, one hull within another, with a space of $4\frac{1}{2}$ feet between them. The armour plates were 8 inches in thickness, with 10 inches of teak backing; on the less important parts, however, the thickness of the iron was reduced to 6 inches and in some places to 4 inches. This ship had a broadside battery, and there were no turrets, but on the deck there were, fore and aft, two semicircular shields formed of iron plates and teak, pierced, with port-holes for cannon, and also with loopholes for muskets. From these a fore-and-aft fire could be kept up. The ship was fully rigged, and had also steam-engines of 7,000 horse-power, by Maudslay and Co. Her armament consisted of four 300-pounders capable of delivering fore-and-aft as well as broadside fire, and twenty-three other guns of the same size between decks; these guns all being Krupp's steel breechloaders.

The great contest of armour plates versus guns has



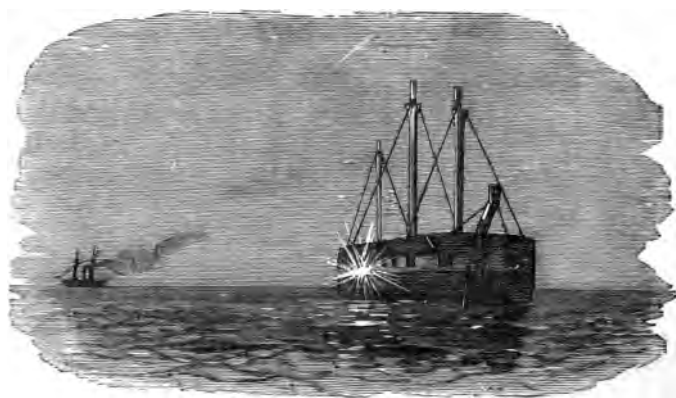
THE "KONIG WILHELM."

already been alluded to, and to the remarks then made it may be added that, while on the one hand guns 80 tons in weight are in course of construction, ships are already designed with 18 inches and even 20 inches of armour plates. It would be very difficult to predict which side will sooner reach the limit beyond which increase of size and power cannot go. The gradual increase of thickness of plating, attended by increased weight of guns, projectiles, and charges of powder, may be illustrated by stating in a condensed form some details of ships already named, as regards the thickness of armour and its resisting power, which is nearly in proportion to the square of its thickness ; and some particulars respecting the guns carried by those ships are also given.

	<i>Warrior.</i>	<i>Hercules.</i>	<i>Glatton.</i>	<i>Thunderer.</i>
Thickness of iron plating in inches.....	4½	9	12	14
Relative resisting power of plating ...	20	81	144	196
Guns carried	Cast iron, smooth bore.	Wrought iron, rifled.	Wrought iron, rifled.	Wrought iron, rifled.
Weight of guns in tons	4½	18	25	35
Charge of powder in lbs.	16	60	70	120
Weight of projectiles in lbs.....	68	400	600	700
Destructive power of projectiles at 1,000 yards range, in foot-tons ...	452	3,863	5,165	8,404

In official trials the power of iron plates to resist projectiles was tested—not only by firing at targets built

to resemble the sides of the vessels, but real floating batteries, like that represented below, were made the subject of experiment ; and although the sides of the battery here depicted were formed of $4\frac{1}{2}$ inch slabs of iron, backed by 22 inches of teak, Sir J. Whitworth's flat-headed projectiles completely penetrated them, punching a clean six-sided hole in the iron plates. The bright flash of light emitted at the instant of the impact is shown in the cut, and the effect to a spectator was much the same as if a gun had been fired from the battery in reply.



The introduction of steam as a propelling power in the Navy has made us in a great measure lose sight of the old-fashioned sailor.

He is very rare in the present day, and, as I fancy, only to be met with occasionally at Portsmouth. The progress

of education, the building of ironclads, the advance of competitive examination, and the neglect of Dibdin's songs by the Admiralty, have wellnigh swept him out of existence. Still you may occasionally see him. He is the same rollicking, hearty, reckless being as of yore, and if he has any money to spend you may be sure he will spend it as



THE OLD-FASHIONED SAILOR.

long as he is on shore. He, however, has some idea with regard to investments, and has heard something about "putting by for a rainy day." I don't think he takes his grog quite so strong or quite so frequently as in the days when they wore pig-tails, but he is quite as brave and as open-handed as he was in those days. If he does not fry gold watches in a frying-pan and eat bank-notes between bread and butter, it is not from any meanness or churlishness, but because he knows he can put his watches and his bank-notes to better use. He can still spin as

good a yarn and sing as jovial a song as ever, but he feels a good deal of heart has been taken out of him by the hideous ironclads and turret ships of the present day. I am inclined to think the real old-fashioned sailor now can only be met with in the person of some brown, kippered, rugose old salt, who left the service long before ironclads were introduced. Before Greenwich Hospital was disestablished you might have seen a score of such grand old fellows among the pensioners ; but the screw steamers still afford scope for seamanship, as they carry as much sail as an ordinary sailing-ship, and I feel sure our tars of the present day will keep the first place not only with respect to seamanship, but with greater prudence, will ever show as much skill and bravery as has always been associated with the idea of true British sailors.





CHAPTER XXVI.

TORPEDOES.

Early history—Various forms of old **torpedoes**—The Russian infernal machine—Torpedoes in the American war—The **Spar torpedo**—The **Whitehead torpedo**—The **Laboratory torpedo**—**Torpedo launches**—Means of defence against them—The electric light.

WE have already traced our good ship to her "grave" in the breaker's yard. This is what we may term "death from natural causes." But ships, like human beings, **can** come to an end by violent means. They not only

run the risk of being wrecked by tempest—and of such calamities which are out of the power of man to prevent—but they are often destroyed purposely, and by man himself. We may surely call this “deliberate murder;” and until mankind gets less quarrelsome such murders will prevail, although they pass by the milder name of “civilized warfare.”

The machine which is now commonly employed to destroy an enemy's ships is called a torpedo. It takes its name from a peculiar kind of fish which is found in various parts of the world, but more especially in the Mediterranean. This animal is provided with a complete electric battery of sufficient power to give an intense shock to a full-grown man. There is no doubt that it uses this faculty as a means of killing its prey, and also as a defence against its numerous enemies.

The torpedo made by man is used for offensive as well as defensive warfare. Although this method of destroying an enemy's shipping has only of late years been brought to practical perfection, the idea is not so new as many would suppose. In point of fact the torpedo was invented by an American of the name of Bushnell, just one hundred years ago. The machine which he constructed was called “the American turtle,” from its resemblance in shape to that animal. It seems to have been a kind of closed boat carrying an operator, whose mission it was to attach a keg of gunpowder to the side of the doomed ship. A clockwork arrangement caused a small gun-lock to act upon the explosive at a certain

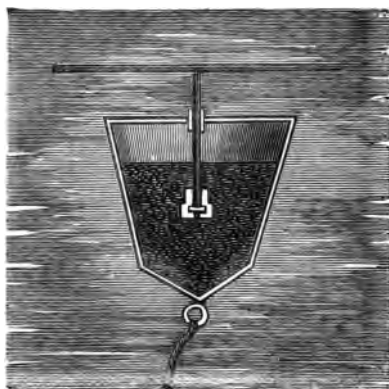
time after it had been placed in position. This plan could evidently only be carried out on a very dark night, and only then when there was a ship to deal with where the crew were all asleep or very silly ; besides which the entire arrangement was too elaborate to be of any practical importance.

The next machine invented—and one which seems in its time to have done much damage to shipping—was in the form of two barrels of powder fastened together by a rope some yards in length. These twin barrels were allowed to float down a river with the view of their coming into collision with an adversary's shipping. An arrangement was provided which caused them to explode directly they came into contact with anything ; and in the case of a ship's bow catching the rope, the two barrels would swing round with the tide and explode together, one on each side of the ill-fated vessel.

But it was, perhaps, in the Crimean war that torpedoes, under the appropriate name of "Russian infernal machines," were first used to any great extent. They now took a new form, for they were exploded by means of a chemical mixture. A very pretty experiment, which it is in the power of any one to make, will in a moment explain their action. Take a small quantity of the white salt known as "chlorate of potash," and carefully reduce it to powder. Treat a like amount of common loaf-sugar in the same way, and then mix the two together. Place a pinch of the mixture on a plate or hob, and touch it with a wire that has been dipped into sulphuric acid. A

violent combustion immediately ensues. Before lucifer matches were invented, the above mixture, contained in little paper cases, was sold under the name of "Prometheus" for the purpose of striking a light. A tiny glass bead full of sulphuric acid was placed in the mixture, the fracture of which led to the production of the light.

We shall now understand the ingenious method upon



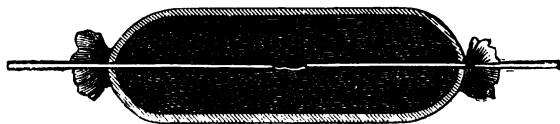
which the Crimean infernal machine was constructed. It may be described as a conical iron barrel (see cut), the lower part of which is filled with some hundred pounds weight of gunpowder. The upper part is empty, so that the machine may be buoyant enough to float above the anchor to which it is attached. An iron bar of a T shape is soldered into the top of the barrel, the lower part of *this bar being placed just above a glass tube of sulphuric*

acid, surrounded by the above-described chlorate mixture. Now it is evident that the upper part of this T is very likely to catch against the bottom of a passing ship, in which case the glass tube is broken, the acid escapes, and an awful explosion takes place. But in practice it was found that this machine was almost as dangerous to friends as to foes ; for, once placed in position, it represented a hidden danger no longer under any kind of control. Let the bar be but touched by a friendly steamer or a harmless merchantman, off it would go and blow them to pieces just as if they were ships of war. Besides this, the mechanism was liable to rust, and consequently became after a time very uncertain in its action, so that since the close of the Crimean war this form of torpedo has become extinct.

But now another power has been applied to torpedo warfare, making it still more resemble the terrible fish from which it takes its name. The same electricity which carries our messages, and which helps us in so many other ways, is now enlisted in the service of torpedoes. It is a fact worthy of notice, that the electrician, who has of late years done so much to forward the arts of peace, and has contributed in such great measure to the comforts of mankind, should be foremost in suggesting means for man's wholesale destruction. The same remark applies with equal force to the chemist, to whose researches every branch of human industry is mainly indebted for its present efficiency. In short, these two founders of natural phenomena would seem to go

hand in hand in both improving the occupations of peace, and rendering more awful the terrors of war. The electric torpedo is, perhaps, the latest and one of the most important results of their partnership.

It must be understood that electricity is not capable of being used as an explosive agent, but merely as a means of igniting an explosive charge such as a torpedo contains. To explain how this is done we must again resort to an experiment, for which we shall require a small electric battery. That known as the bi-chromate battery is perhaps the best for experimental use, but any



other kind will do so long as it is powerful enough to bring half an inch of thin platinum or iron wire to a red heat. Our model torpedo may consist of a paper case filled with an ounce of gunpowder (see cut). We shall next require two pieces of india rubber-covered copper wire each about six yards long. (This wire can be had at any electrical warehouse for about one penny per yard. The length required will altogether depend upon the circumstances under which the experiment is performed.) On referring to the woodcut we shall see that these wires are inserted into the paper case, one at each end. They themselves do not actually meet in the centre of the

cartridge, but they are connected by a very fine iron or platinum wire. The whole is covered either with a piece of bladder, or, what is better, indiarubber tissue, which can be hermetically sealed by just wetting the joints with benzoline or chloroform. Our little torpedo may now be sunk in a pond or river, or, failing these, a pail of water will answer the purpose. The two wires are now carried to the place where the battery is in readiness, and one of the wires is attached to it. The other wire must be left loose until everything is completed, and provided the connections have been properly made, directly it is placed in position—*i.e.*, when the electric circuit is established—the torpedo will explode, and will send up quite an imposing column of water. To make the illusion more perfect, a model ship may be anchored immediately over the sunken mine, when she will speedily be laid on her beam ends. An experiment like this is worth dozens of printed paragraphs, for it not only explains, but it indelibly fixes upon the memory, the real manner in which this important naval operation is carried out.

The electric torpedo first came into use during the civil war in America, and on more than one occasion it was instrumental in launching an entire ship's crew into eternity. Its explosion is under the control of operators on shore, who are often placed at a distance of some miles from the sunken mine which they command. By suitable instruments these men are enabled to observe when an enemy's ship passes over a torpedo; the touch of a trigger will cause the electric spark to traverse the

fuse, and the vessel is blown into fragments. By a clever arrangement it is possible to pass a weak electric current through the wires attached to a torpedo without exploding it, thus affording a guarantee that it is in working order. The importance of this test may be gauged when we consider the probability of an enemy suspecting the presence of such machines, and by means of small boats grappling for and separating the conducting-wires, without those on shore being aware, until the time came for action, that their means of defence had been rendered futile.

There are various ways of employing these stationary mines. The oldest method was to fasten by means of an anchor and chain after the manner of the Russian infernal machine, already described. A great improvement was adopted in the defence of Venice in 1859. The weight or anchor consisted of a triangular piece of metal, above which the torpedo floated. The employment of three attaching chains, one to each point of the triangle, prevented the torpedo turning round, and so disarranging the electrical wires. Another method was to fix the torpedo on to a stake driven into the ground beneath the water, on the chance of a ship going near enough to strike it. This is known as the "pile torpedo." Another plan, called the "frame torpedo," is to fix the machine or machines on a floating frame of timber, the lower end of which is secured to the ground. All these various methods have from time to time been adopted, and they all depend for ignition either upon the contact fuse, or the electric battery.

Hitherto we have merely spoken of stationary torpedoes, which may be more properly termed submarine mines. Their use is strictly defensive, and is confined to the protection of rivers, harbours, and the like. But we will now describe those of quite another character.

The introduction of explosives of far greater power than gunpowder has placed torpedo warfare upon a new footing. Both gun-cotton and dynamite are now used in preference to "villanous saltpetre" because weight for weight they are about six times more destructive; moreover, they exhibit an instantaneous energy, compared to which the explosion of gunpowder is feeble and gradual. Gun-cotton is made by immersing ordinary cotton in a mixture of sulphuric and nitric acid of particular strength and temperature. After its immersion it is thoroughly washed until every trace of acid is eliminated. Although its appearance after this treatment is unaltered, its nature has completely changed, for it is now transformed into a terrible explosive agent. Dynamite is made by soaking a porous earth with that dangerous mixture known as nitro-glycerine. It is not so safe to handle as gun-cotton, for the latter can be kept in a bath of water without damage, and can, under these conditions, be rendered harmless until required for use. Although—for reasons which we cannot here enter into—these new explosives are quite unfit for gunnery, they are most valuable for torpedoes, if we only take into consideration the difference of bulk which they represent compared to a charge of gunpowder competent to do equal damage.

The spar torpedo is that which probably—from the ease with which it can be manipulated—has done more damage than any other yet invented. It consists of a canister of dynamite placed at the end of a long pole which projects from the bows of a boat. It is exploded beneath the water-line of a ship's side either by a percussion fuse or by electricity. The water seems to act as a cushion to the small attacking vessel, which generally escapes without injury. Our readers will remember that in the late Russo-Turkish struggle an ironclad belonging to the Turks was sunk in a few brief moments by an attack of this kind. But many years before this the spar torpedo had been at work. In the American war it was often used with the most destructive effect, notably on one occasion in Charleston Harbour ; but in this case the torpedo boat was sunk as well as her adversary.

Torpedo launches are small steel vessels furnished with engines of such power that they are able to travel very quickly. Their movements are so rapid, and they lie so low in the water, that once within a certain distance the attacked ship cannot work its guns quickly enough, or depress them low enough to hit them. In fact, the torpedo is applied, a mountain of water is thrown up, the ship is sinking, and the launch is clear off before any one is aware of what has happened. It is fearful to contemplate that modern ingenuity has brought wholesale destruction of life, to say nothing of property, to such a fiendish pitch of perfection. But we must not stop to moralize about the matter, our duty is to point out how

these machines are made to carry out their deadly work, and we must leave to others the task of reconciling their use with the civilization of which we are so fond of boasting.

The torpedo last mentioned is a very simple and inexpensive affair compared to that known as the "Whitehead" or fish torpedo (see cut). This engine, the cost of which is no less than £500, may be described as a round steel box pointed at each end like a cigar. It is furnished at its stern with a screw-propeller, which is set in motion by compressed air. The interior contains a bursting



FISH TORPEDO.

charge of gun-cotton equal in effect to about 1,200 pounds of gunpowder. There is also within it a chamber for the compressed air, while the remaining space is occupied by the little engine which turns the screw. The Whitehead torpedo is discharged from a tube placed in the side of an attacking ship, and it travels under water at any depth which may be previously decided upon. The mechanism whereby this last part of its performance is accomplished is kept secret by the authorities, but as the inventor is supplying his torpedoes to any nation who likes to order them, the secret is before long likely to leak out.

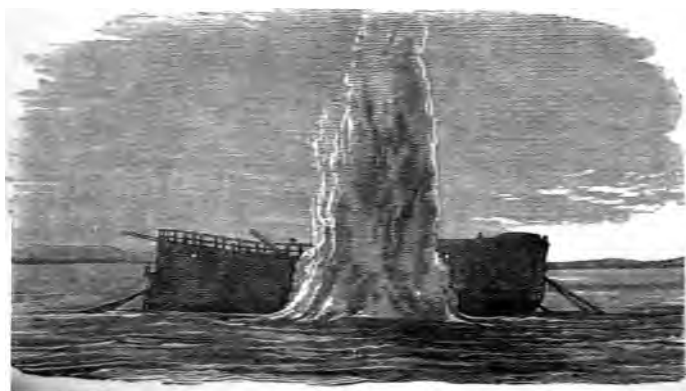
Upon reaching the enemy's vessel (which event is of

course uncertain) a percussion fuse at the head of the torpedo causes it to explode. But we may also say that its ignition is not a matter of course even if the torpedo hits the mark for which it is intended; for in the late war some of these engines were employed against the Turkish fleet without success; although one which was picked up the following morning bore evident signs of having knocked its head against a ship's side. So much for the Whitehead torpedo. But there is yet another, about which as yet only vague rumours reach us. It has been constructed at Woolwich Arsenal, and is known as the "laboratory torpedo." It is said to travel at the astonishing rate of forty miles an hour, and to be more effective in every way than the Whitehead. Further than this we are not in a position to say anything about it, except that we should not like to be within its range, whatever that may be.

With such diabolical machines for encompassing the destruction of ships, our readers may naturally ask whether there is not some means of defence against such intruders? We reply that our naval authorities are now trying to solve that problem. Electricity, in the form of light, is one of the antidotes which has been suggested, and several of Her Majesty's fleet are now being fitted with apparatus for its production. An intense ray of light, which can be made to sweep the waters in every direction, will detect the approach of a torpedo-boat long before it has time to become dangerous. The employment of the electric light for this

purpose has been rendered possible by the vast improvements which have been lately devised in its use. Whereas, a few years ago, the light could only be obtained by the use of powerful and expensive batteries, which required constant attention, and which would be quite out of place on board a ship; the fluid can now be generated by a little machine not much bigger than a hatbox. It certainly requires steam as a motive power, but this is, of course, always available in our ironclads.

But the electric light merely points out to the watchful seaman that his home is threatened. For active defence against torpedo attack, netting or crinoline, as it is called, is buoyed at a suitable distance round the ship while at anchor, while small steam launches, incessantly on the move, play the part of sentries round about it. Let us hope that the time is far distant when our own brave British tars will be compelled to put such precautions into active operation.



APPENDIX.



OFFICERING OF A MODERN SHIP-OF-WAR.

As showing the change between the old system given at page 46, and the Officering of a modern Ship-of-war, we give the following list of the Officers, including Supernumeraries for Training and Special Services, of the *Iron Duke* in the Chinese Seas in 1874 :—

“IRON DUKE” DOUBLE-SCREW IRON SHIP, ARMOUR-PLATED,
6,034 (3,787) TONS, 4,268 (800) H.P.

Flag Ship of Rear-Admiral Shadwell, holding local rank
of Vice-Admiral in the Chinese Seas, 1874.

Rear-Admiral.

Flag-Lieutenant.

Secretary.

Clerks to Secretary, 2. (The Second Clerk being Assistant
Paymaster.)

Captain.

Commander.

Lieutenants, 5.

Supernumerary Lieutenants, 3.

Navigating Lieutenant.

Chaplain and Naval Instructor.

Lieutenant Royal Marine Artillery.

Staff Surgeon.

Supernumerary Surgeon. (For special service in connection with
Lock Hospital in China and Japan.)

Surgeon. (For service with Marine Battalion.)

Physician. (For Sick Quarters, Yokohama.)

Paymaster.

- Chief Engineer.
- Sub-Lieutenants, 5.
- Supernumerary Lieutenants, 6.
- Naval Sub-Lieutenant.
- Assistant Surgeons, 2.
 - Do. (for Sick Quarters, Yokohama), 1.
 - Do. (for service with Marine Battalion), 1.
 - Do. (for service with British Legation), 1.
- Assistant Paymaster.
 - Do., (for disposal), 7.
- Engineers, 5.
 - Do. (for disposal), 1.
- Assistant Engineer, 2nd Class.
- Gunner, 1st Class.
- Gunners, 2nd Class (3 for disposal).
- Boatswain, 1st Class.
 - Do. 2nd Class, 3.
- Carpenter, 1st Class.
- Midshipmen, 6.
- Supernumerary Midshipmen, 6
- Navigating Midshipman.
- Supernumerary Nav. Midshipmen, 2.
- Assistant Engineer, 1st Class, 1.
- Supernumerary Engineer, 1st Class, 1.
 - Do. Engineers, 2nd Class, 3.
- Clerks (for disposal), 4.
- Assistant Clerk.

Instead of the rating of vessels as of old, given at p. 50, the following is now the rating :—

CLASSES AND DENOMINATIONS ON H.M. SHIPS.

1st.—RATED SHIPS, that is to say, Ships registered on the list of the Royal Navy, under one of the six following Rates :—

First Rates to comprise all Ships carrying 110 guns and upwards, or the complements of which consist of 1,000 men or more.

Second Rates to comprise one of Her Majesty's Yachts and all Ships carrying under 110 guns and more than 80 guns, or the complements of which are under 1,000, and not less than 800 men.

Third Rates, to comprise Her Majesty's other Yachts and all such Vessels as may bear the flag or pendant of any Admiral Superintendent, or Captain Superintendent of one of Her Majesty's Dockyards, and all Ships carrying 80 and not less than 60 guns ; or the complements of which are under 800 and more than 600 men.

Fourth Rates to comprise all Frigate-built Ships of which the complements are 600 and not less than 400 men.

Fifth Rates to comprise all Ships, the complements of which are 400 and not less than 300 men ; and

Sixth Rates to consist of all other Ships bearing a captain.

2nd.—SLOOPS, to comprise all vessels commanded by Commanders and carrying their principal armament on one deck in broadside ports.

3rd.—GUN VESSELS, to comprise all vessels commanded by Commanders, and carrying their principal armament on one deck amidships.

4th.—ALL OTHER AND SMALLER VESSELS, commanded by Lieutenants.

The following Abbreviations will be found very useful in reading about Ships and Officers.

A. F.	denotes	Admiral of the Fleet.
A.	. . .	Admiral.
V. A.	. . .	Vice-Admiral.
R. A.	. . .	Rear-Admiral.
C.	. . .	Captain.
Cr.	. . .	Commander.
L.	. . .	Lieutenant.
S. L.	. . .	Sub-Lieutenant.
Mid.	. . .	Midshipman.
N. C.	. . .	Naval Cadet.
S. C.	. . .	Staff Captain.
S. Cr.	. . .	Staff Commander.
N. L.	. . .	Navigating Lieutenant.
N. S. L.	. . .	Navigating Sub-Lieut.
Ch. E. Ins.	. . .	Chief Inspector of Machinery.
E. Ins.	. . .	Inspector of Machinery.
Ch. E.	. . .	Chief Engineer.
S. E.	. . .	Engineer for Special Charge.
E.	. . .	Engineer.
A. E.	. . .	Assistant Engineer.
Ch.	. . .	Chaplain.
N. I.	. . .	Naval Instructor.
I. H.	. . .	Inspector-General of Hospitals and Fleets.
D. I. H.	. . .	Deputy Inspector-General of Hospitals and Fleets.
F. S.	. . .	Fleet Surgeon.
S. S.	. . .	Staff Surgeon.
S.	. . .	Surgeon.
Ch. P.	. . .	Paymaster-in-Chief.
P.	. . .	Paymaster.
A. P.	. . .	Assistant Paymaster.

Clk. . . .	Clerk.
As. Clk. . . .	Assistant Clerk.
Ch. Gr. . . .	Chief Gunner.
Gr. . . .	Gunner.
Ch. B. . . .	Chief Boatswain.
B. . . .	Boatswain.
Ch. Car. . . .	Chief Carpenter.
Car. . . .	Carpenter.
R. M. . . .	Royal Marines.
R. M. A. . . .	Royal Marine Artillery.
R. M. Col. . . .	Colonel Royal Marines.
R. M. Lt.-Col. . . .	Lieutenant-Colonel Royal Marines.
R. M. Maj. . . .	Major Royal Marines.
R. M. C. . . .	Captain Royal Marines.
R. M. L. . . .	Lieutenant Royal Marines.
R. M. Q. M. . . .	Quartermaster Royal Marines.
P. S. C. . . .	Passed Staff College.

The figures preceding each name denote the number of the ship in which the officer is serving.

CG. . . .	Coast Guard.
DY. . . .	Dockyard.
VY. . . .	Victualling Yard.
NH. . . .	Naval Hospital.
GH. . . .	Greenwich Hospital.
TS. . . .	in the Transport Service.
KW. . . .	Knight of Windsor.
GSP. . . .	Good Service Pension.
PW. . . .	Pension for Wounds.
GHP. . . .	Greenwich Hospital Pension.
NP. . . .	Naval Pension, late Out-Pension of Greenwich Hos- pital.
CGP. . . .	Coast Guard Pension.
AdC. . . .	Aide-de-Camp to the Queen.

- Sec.* . . . Secretary to a Flag Officer.
AO. . . . Clerk to Secretary to a Flag Officer
I . . . Chaplains holding Civil Appointments.
Coll. . . . Officers studying at Royal Naval College.
 † . . . Lieutenants who have passed for Gunnery Officers.
 † . . . In a ship, a Gunnery Officer borne for Gunnery Duties.
 † . . . Navigating Officers qualified to take charge of any
 of H.M. first-class ships.
 † . . . Surgeons who have passed for Staff-Surgeon.
 † . . . Engineer Officers who have passed the qualifying
 Examination for the rank of Chief Engineer.
 (N) . . . Executive Officers who have passed for Navigating
 Duties, and Officers transferred from Navigating
 to Executive List under Circular 18 of 1876.
 (N) . . . In a ship, an Executive Officer borne for Navigating
 Duties.
 (I) . . . Officers who have passed for Interpreters.

NOTE.—Temporary Service Engineers and Assistant Engineers appear as E and AE with (tempy) against their names.



HONORARY DISTINCTIONS.

K.G.	denotes the Officer to be a	Knight of the Garter.
G.C.B.	. . . . .	Knight Grand Cross of the Bath.
K.C.B.	. . . . .	Knight Commander of ditto.
C.B.	. . . . .	Companion of ditto.
K.T.	. . . . .	Knight of the Thistle.
G.C.M.G.	. . . . .	Grand Cross of St. Michael and St. George.
K.C.M.G.	. . . . .	Knight Commander of St. Michael and St. George.
C.M.G.	. . . . .	Companion of St. Michael and St. George.
G.C.S.I.	. . . . .	Grand Cross of the Star of India.
K.C.S.I.	. . . . .	Knight Commander of ditto.
C.S.I.	. . . . .	Companion of ditto.
C.O.I.	. . . . .	Companion of the Order of the Indian Empire.
G.C.H.	. . . . .	Grand Cross of Hanoverian Guelphic Order.
K.C.H.	. . . . .	Knight Commander of ditto.
K.H.	. . . . .	Knight of ditto.
(G)	. . . . .	to have received a Gold Medal for service in the Field.
✱	. . . . .	to have received the Victoria Cross.
(A)	. . . . .	the Albert Medal.
(Δ)	. . . . .	the Goodenough Medal.

Officers entitled to wear Medals are denoted by the letter m prefixed to their names in the Seniority Lists.

Hy Phy or *Hy Sgn* before the name of a *Medical* Officer in the

Seniority Lists denotes that he is an Honorary Physician or Surgeon to the Queen.

* *before* the name in the Seniority Lists denotes Officers authorized to wear Foreign Orders; * *after* the name in the case of a Medical Officer, Sir Gilbert Blane's Medal; and *after* the name in the case of any other Officer, denotes that he has been awarded the "Beaufort Testimonial."

(c) *after* the name in the Seniority Lists denotes the Officers who have obtained their Lieutenants' Commissions by competition at the Royal Naval College, under Admiralty Order of 24th December, 1838; (E), those who have obtained the same for meritorious Examination at the Royal Naval College subject to the provisions of Circular No. 1^o C, of 21st June, 1865, and No. 28 C, of 14th March, 1874; and (G), those who have received Honorary Certificates under the provisions of Circular No. 8 C, of 30th January, 1873.

Officers whose names are in *Italics* in the List of Ships are those borne as additional or supernumerary



THE END.

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